

**PETROLEUM STORAGE TANK RELEASE TRUST FUND**

**REMEDIAL DESIGN PLAN**

**REQUEST FOR PROPOSAL**



**Kansas Department of Health and Environment**

**Bureau of Environmental Remediation**

**Storage Tank Section**



**K A N S A S**

RODERICK L. BREMBY, SECRETARY

DEPARTMENT OF HEALTH AND ENVIRONMENT

KATHLEEN SEBELIUS, GOVERNOR

September 2, 2003

Dear Prospective Bidder:

Significant revisions have been made to the enclosed Remedial Design Report/Remedial Design Plan Request for Proposal (RDR/RDP RFP); therefore we strongly recommend you thoroughly read the document prior to bidding. Vendors are responsible for reading and fully understanding all requirements in this document. If you are unable or unwilling to fulfill these requirements, please reconsider participating in the bidding process.

Revisions to this document reflect the recent changes to the Remedial Design Plan and include but is not limited to, a definition of "field notes", requirements for excavation/landfarm proposals, owner/operator approval for the equipment and trenching location, and power supply verification and bid to extend service by the Project Engineer. The work will still be completed in two phases. The first phase consists of the Remedial Design Report that proposes the most effective remedial action on the site. The second phase consists of a remedial Design Plan that includes plans and specifications for constructing and operating the remedial system.

The remedial philosophy KDHE is promoting within this Request for Proposal is one which will aggressively remediate the source area of the contamination and treat the receptor if it becomes impacted. It is imperative that the Vendor identify and investigate all potential source areas and receptors. Also, the groundwater must be carefully evaluated to determine if contaminant migration is still taking place. If natural attenuation has stabilized the boundaries of the plume, activities related to groundwater may be limited to monitoring groundwater quality. If groundwater contamination is demonstrated to be migrating towards a receptor, design of a water treatment system may be necessary.

If you should have any questions, please do not hesitate to contact me at (785) 296-5931.

Respectfully,

Greg Hattan  
Environmental Geologist  
Bureau of Environmental Remediation

## TABLE OF CONTENTS

### SECTION 1.0

PROPOSAL PROCESS INFORMATION .....	1
------------------------------------	---

### SECTION 2.0

CONTRACT INFORMATION .....	5
----------------------------	---

### SECTION 3.0

STATEMENT OF WORK .....	8
-------------------------	---

### SECTION 4.0

DELIVERABLES .....	19
--------------------	----

### SECTION 5.0

REIMBURSEMENT .....	32
---------------------	----

### SECTION 6.0

PROPOSAL AND WORK SPECIFIC DEFINITIONS .....	33
--	----

### ATTACHMENTS

ATTACHMENT A .....	KDHE Monitoring Well Design
ATTACHMENT B .....	Soil Boring Plugging Criteria KAR 28-30-7(d)
ATTACHMENT C .....	Laboratory Methods
ATTACHMENT D .....	KDHE Well Tagging Procedure
ATTACHMENT E .....	Field Work Plan Worksheet
ATTACHMENT F .....	Time Sheets
ATTACHMENT G .....	Owner/Operator Standard Contract
ATTACHMENT H .....	Equipment Standards
ATTACHMENT I .....	Landfarm Application Information

### EXHIBITS

EXHIBIT 1 .....	Site Specific Information
EXHIBIT 2 .....	Project Bid Proposal Sheets

## **SECTION 1.0 PROPOSAL PROCESS INFORMATION**

### **1.1 PURPOSE**

On behalf of the Owner/Operator (O/O), the Kansas Department of Health and Environment (KDHE) is soliciting bids from qualified Vendors to design a corrective action plan that will address the contamination specified by KDHE. The corrective action plan will be called the Remedial Design Report/Remedial Design Plan (RDR/RDP).

### **1.2 OBJECTIVE**

- 1.2.1 To provide information necessary for the preparation of competitive proposals by qualified Vendors.
- 1.2.2 To provide for a fair and objective evaluation of proposals.
- 1.2.3 To result in a contract between the O/O and the Vendor to provide the services as described in Sections 3.0 and 4.0 of this Request for Proposal (RFP).

### **1.3 DEFINITIONS**

- 1.3.1 "Corrective Action" means all action necessary to contain, collect, control, identify, analyze, clean up, treat, disperse, remove, or dispose of soils and groundwater contaminated by a release of petroleum products from a storage tank.
- 1.3.2 "Field Geologist" is the designated site representative for the vendor. This position works under the direct supervision of the vendor's designated "Project Geologist". Minimum qualifications for this position are:
  - 1) A BS in Geology from an accredited four year college or a related degree with a minimum of 30 semester hours of geologic course work.
  - 2) Has overseen drilling activities and has described and recorded the subsurface lithology during the drilling of at least 21 boreholes.
  - 3) Has performed a minimum of 3 successful soil vapor extraction/air sparge tests.
- 1.3.3 "Field Notes" are a complete and accurate account of all field activities that relate to work conducted on a Trust Fund site. The notes are to be kept in a bound, hard covered notebook with waterproof, resin impregnated paper. Field notes are a legal document and must be treated as such with a new page for each day work is conducted. All entries must be legible, and errors should be lined out with a single line with no erasing. The notes should include but not be limited to date, time, site name/project number, weather conditions, drill crew/field staff/support personnel, and contacts on and off site. A complete description of all field activities must be recorded: drilling and excavations with drill rig size/type and/or equipment used, amounts and types of material used, depths reached, lithologies and field readings, all amounts of material used for completions; pilot testing: distance from each extraction or injection well to each observation well, and other information detailed under SVE or AS testing; trenching/piping installation: description of soils removed, bedding material, and piping elevation survey information; and all information needed for complete record keeping. Hand drawn maps/charts should be included when necessary. At the end of the work day, a diagonal line will be drawn through any remaining space on the page and the keeper of the field notes shall sign and date the page. Field notes must be made available upon request by KDHE personnel.
- 1.3.4 "Hazardous substance" shall have the meaning ascribed to such term by section 101 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980

of the United States as in effect on January 1, 1992.

- 1.3.5 "Landscape Professional" means an individual or company that engages in landscaping activities as a primary or substantial source of revenue. A Landscaping Professional must possess a tax ID number and liability insurance under the company name. The landscaping professional cannot be an employee of the Vendor.
- 1.3.6 "Release" means any spilling, leaking, pumping, pouring, emitting, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any Hazardous substance).
- 1.3.7 "Petroleum" means petroleum, including crude oil or any fraction thereof, which is liquid at standard conditions of temperature and pressure, including but not limited to, gasoline, gasohol, diesel fuel, fuel oils and kerosene.
- 1.3.8 "Other pollutant" means any substance determined by the Secretary of Health and Environment that poses a substantial present or potential hazard to human health or the environment when released. The term does not include radioactive materials regulated by K.S.A. 48-16-01 et seq.
- 1.3.9 "Vendor" means any person (individual, partnership, association or corporation) who is seeking or is chosen to enter into a procurement contract with the O/O.
- 1.3.10 "Project Manager" means the KDHE staff geologist designated as the lead technical interface with the Vendor.
- 1.3.11 "Contract Administrator" means the KDHE Central Office staff person designated as the primary contact between the Vendor and KDHE regarding administration of the contract terms.
- 1.3.12 "Project Geologist" this position is either the designated site representative for the Vendor, or the designated supervisor of the Vendor's "Field Geologist(s)". Minimum qualifications for the Project Geologist are:
- 1) All the minimum qualifications for a "Field Geologist".
  - 2) Currently a licensed geologist in the state of Kansas.

The Project Geologist is responsible for the preparation and certification of all geological information in reports and on maps.

- 1.3.12 "Project Engineer" is the person designated by the Vendor to develop the RDP. The minimum qualifications for this position are 1) is a licensed Professional Engineer in the State of Kansas, 2) has successfully designed a minimum of five remedial systems that are similar to the type(s) specified in this RFP, and 3) the five designs have been implemented and they are or have been successful in remediating the contamination.

## 1.4 INQUIRIES

- 1.4.1 All written inquiries concerning this RFP must be submitted to:

Petroleum Storage Tank Release Trust Fund  
1000 SW Jackson , Suite 410  
Topeka, KS 66612  
Attn: Mickey Trimble  
Fax (785) 296-6190

- 1.4.2 All inquiries must be received no later than one week prior to the bid deadline.
- 1.4.3 Answers to all written questions will be distributed to all participating prospective Vendors by mail.
- 1.4.4 In all cases, no verbal communication will override written communications and only written communications are binding.

## **1.5 REVISIONS TO THE REQUEST FOR PROPOSAL**

In the event it becomes necessary to revise any part of this RFP, revisions will be provided in writing to all Vendors who received this RFP initially.

## **1.6 SUBCONTRACTORS**

If the Vendor intends to subcontract any part of the work to be performed under this RFP, the Vendor must include in its proposal a complete list of potential subcontractors and a description of the work which will be subcontracted. The Vendor is responsible for assuring the subcontractors possess all licenses as required by the State of Kansas for the services they will provide.

## **1.7 SUBMISSION OF PROPOSAL**

The Vendor's sealed proposal must be received by the Petroleum Storage Tank Release Trust Fund no later than 3:00 p.m. on the date specified in the PROJECT BID PROPOSAL SHEET. Proposals should be addressed to:

Petroleum Storage Tank Release Trust Fund  
1000 SW Jackson , Suite 410  
Topeka, KS 66612  
Attn: Mickey Trimble  
Fax (785) 296-6190

- 1.7.1 The envelope must be marked to indicate "**SEALED BID**" in bold lettering. Also, the bid number of the enclosed bid is to be displayed on the outside of the envelope.
- 1.7.2 Late proposals will not be accepted and will be returned to the Vendor.
- 1.7.3 KDHE and/or the O/O will not pay for any information herein requested, nor are they liable for any costs incurred by the Vendor to prepare or submit a proposal.
- 1.7.4 All proposals shall be submitted on the Project Bid Proposal Sheet (EXHIBIT 2) and when applicable on the Project Bid Summary Sheet that will be a part of EXHIBIT 2.

## **1.8 WITHDRAWAL OF BIDS**

A Vendor may withdraw a bid at any time prior to the scheduled closing time for receipt of proposals.

## **1.9 PROPOSAL OBLIGATIONS**

The contents of the proposal and any clarification thereto submitted by the successful Vendor shall become part of the contractual obligation and will be incorporated by reference into the ensuing contract.

## **1.10 TERM OF PROPOSAL**

All proposals shall be firm for a period of ninety (90) days after the proposal due date to allow time for evaluation of all proposals and to make an award.

## **1.11 DISPOSITION OF PROPOSALS**

All proposals become the property of the State of Kansas upon receipt and will not be returned to the Vendor. The State of Kansas shall have the right to use all ideas or adaption of ideas contained in any proposal received in response to this RFP. Selection or rejection of the proposal will not affect this right.

## **1.12 NOTIFICATION OF APPROVED COSTS**

After evaluation of the proposals all Vendors who submitted proposals will be notified in writing of the approved costs for the project.

## **1.13 EVALUATION CRITERIA**

Proposals will be evaluated on: (1) the Vendors total cost as submitted on Project Bid Proposal Sheets, (2) experience, (3) expertise, and (4) past performance on KDHE Trust Fund sites. The final determination of approved costs for the project will be in the best interest of the O/O and KDHE.

## **1.14 CONFLICT OR AMBIGUITIES**

Vendors shall notify KDHE immediately if conflicts or ambiguities are found in the Request For Proposal. Failure to do so prior to the specified closing date may result in these items being resolved in a manner deemed to be in the State's best interest as judged by the KDHE Underground Storage Tank Staff.

## **SECTION 2.0 CONTRACT INFORMATION**

### **2.1 PURPOSE**

This section will outline the type of contract contemplated and will set forth contract clauses that need to be contained in any resultant contract.

### **2.2 CONTRACT DOCUMENT**

2.2.1 The Contract between the O/O and Vendor shall consist of: (1) This RFP and any amendments thereto, (2) the Vendors proposal submitted in response to the RFP, and (3) the Contractual Provisions form # O/O 101, 7/92 (See ATTACHMENT G).

2.2.2 For the purpose of contract uniformity, the O/O's standard form contract and Contractual Provisions (ATTACHMENT G) should be utilized.

2.2.3 In the event of any inconsistency or contradiction between this RFP and the Vendor's proposal and/or contract form, the provisions of this RFP are controlling.

### **2.3 RESPONSIBILITIES**

2.3.1 The O/O is responsible for assuring that all work is conducted in accordance with KDHE specifications described in SECTION 3.0, 4.0 and 5.0.

2.3.2 The O/O and the Vendor selected to perform this scope of work are responsible for maintaining the initial project costs approved by KDHE. Any change to the value of this contract will be in accordance with the Vendor's proposed unit pricing and must be approved in writing by KDHE prior to the Vendor commencing work.

2.3.3 The O/O and the Vendor are responsible for securing and complying with any and all federal, State of Kansas or local permits and regulations regarding the Scope of Work defined in this RFP.

### **2.4 ERRORS IN PREPARATION**

The Vendor is responsible for any mathematical error or incorrect extension of any calculations in the Vendors price quotes. In case of discrepancies, the Vendor unit cost will be multiplied by the units provided and the resultant unit price will be used in the evaluation. If there is an error in the proposal, it will be disqualified if there is a five percent or less difference between it and the next lowest qualified proposal. If the percent difference is greater than five percent, the corrected amount will be considered the Vendor's submission and subject to approval.

### **2.5 CONTRACT AMENDMENTS**

Modification, amendment or any extension to a contract resulting from this RFP must be in writing. The O/O must receive prior written approval from KDHE for the changes. KDHE reserves the right to deny any modifications, amendments, or extensions.

### **2.6 COMPLIANCE WITH LAW**

The Vendor agrees to comply with all applicable federal, state, and local laws, rules regulations and ordinances; and all provisions required thereby to be included herein, are hereby incorporated by reference. The Vendor agrees to indemnify and hold the O/O and KDHE harmless from any loss, damage, or liability resulting from the violation on the part of the Vendor of such laws, rules, regulations, or ordinances.

### **2.7 SEVERABILITY**

The invalidity in whole or part of any provision of the contract shall not void or affect the validity of any other provision.

## 2.8 ASSIGNMENT, TRANSFER, CONVEYANCE, SUBCONTRACT, AND DISPOSAL

The Vendor shall not assign, transfer, convey, subcontract, or dispose of any contract resulting from this RFP, or its rights, title, interest, or power to execute such assignments to any other person, company, corporation, or entity without the written consent of the O/O and KDHE.

## 2.9 INSURANCE

The Vendor shall maintain, at its expense during the term of the contract, the following insurance covering the services to be performed under this contract:

2.9.1 Workmen's compensation-statutory

2.9.2 Employers liability insurance in the minimum amount of \$500,000.00 per occurrence with a \$1,000,000.00 aggregate.

2.9.3 Comprehensive general liability insurance of \$1,000,000.00 per occurrence with a \$1,000,000.00 aggregate.

2.9.4 Vehicle liability (property damage and bodily injury combined) \$500,000.00 per occurrence.

2.9.5 Professional liability insurance of \$1,000,000.00 per occurrence with a \$1,000,000.00 aggregate.

2.9.6 The successful Vendor will provide the O/O, within twenty (20) working days of the contract signing, a certificate of insurance (Accord Form 25-S) naming the O/O as the certificate holder. The cancellation clause of the Accord Form will read as follows:

**"Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will endeavor to mail 10 days written notice to the certificated holder named to the left, but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives."**

A copy of this document must be provided to the KDHE within the same time period.

## 2.10 INDEMNIFICATION

Neither the O/O or KDHE shall be liable for any damage or compensation payable at law in respect or in consequence of any accident or injury to any worker or other person in the employment of the Vendor or any subcontractor, save and except an accident or injury resulting from a willful negligent act or default of the O/O or KDHE.

The Vendor shall indemnify and keep indemnified the O/O and KDHE against all such damages and compensation, save and except as aforesaid, and against all claims, proceedings, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

## 2.11 COMMUNICATION AND NOTICES

Any written notice to the Vendor shall be deemed sufficient when deposited in the United States mail, postage prepaid, and addressed to the Vendor at its address listed on the signature page of the contract or at such address as the Vendor may have requested in writing or which is hand carried and presented to an authorized employee of the Vendor at its address as listed on the signature page of the contract.

## **2.12 TERMINATION**

### **2.12.1 Termination for cause**

The O/O or Vendor may terminate the contract resulting from this RFP at any time when either party fails to carry out its obligations under the provisions of this RFP or to make substantial progress under the terms specified in the RFP and the resulting proposal and contract.

2.12.2 The O/O shall provide the Vendor with written notice of conditions adversely affecting performance. If after such notice the Vendor fails to remedy the conditions contained in the notice within ten (10) days the O/O may issue the Vendor an order to stop work immediately and exercise their right to terminate the contract.

2.12.3 The Vendor shall provide the O/O with written notice of conditions adversely affecting performance. If after such notice the O/O fails to remedy the conditions contained in the notice within ten (10) days the Vendor may exercise their right to terminate the contract.

2.12.4 The O/O shall be obligated only for the services performed in accordance with the RFP specifications prior to the date of termination notice.

## **2.13 WAIVER**

In the event of breach of contract or any provision thereof, the failure of the O/O to exercise any of its rights or remedies under this contract shall not be construed as a waiver of any such provision of the contract breached or as an acquiescence in the breach.

The remedies herein reserved shall be cumulative and additional to any other remedies at law.

## **SECTION 3.0 STATEMENT OF WORK**

### **3.1 GENERAL INFORMATION**

- 3.1.1 The following information is provided to assist the O/O in obtaining proposals for the scope of work necessary to accomplish the goals outlined herein.
- 3.1.2 All modifications to the proposal must be approved in writing by KDHE prior to the initiation of work.
- 3.1.3 KDHE reserves the right to reject any modification to proposals.
- 3.1.4 This contract will be discontinued or modified if KDHE determines the level of contamination or the ranking of the site does not warrant further cleanup, or if the scope of work, as defined by KDHE, changes significantly.
- 3.1.5 Definitions for items included on the Project Bid Proposal Sheets and other work specific terms can be found in SECTION 6.0.
- 3.1.6 Vendor is responsible for insuring that work performed under this contract complies with all applicable standard operating procedures (SOP's) as included in KDHE-Division of Environment Quality Management Plan (QMP) 2001 or directed by the KDHE Project Manager if it is determined by the KDHE that more rigorous operating procedures are warranted. The KDHE-Division of Environment Quality Management Plan (QMP) 2001 can be obtained from KDHE or from the KDHE website at <http://www.kdhe.state.ks.us/environment>

### **3.2 SITE INFORMATION**

- 3.2.1 Review the Site Specific Information for each site in EXHIBIT 1. Conduct the work described therein following the requirements outlined in this document.

### **3.3 REMEDIAL DESIGN REPORT AND REMEDIAL DESIGN PLAN**

#### **3.3.1 Remedial Design Report and Remedial Design Plan Goals**

- 3.3.1.1 Develop and complete a Remedial Design Report (RDR) and Remedial Design Plan (RDP) in accordance with all requirements outlined in this document.
- 3.3.1.2 Use data obtained during all investigation phases to develop a Remedial Design Report that will present feasible, cost-effective technologies which aggressively address source area(s) of contamination specified by KDHE in EXHIBIT 1, Site Specific Information and any additional contamination detected during remedial work.
- 3.3.1.3 Upon KDHE approval of the Remedial Design Report, develop a Remedial Design Plan that will be complete to the extent that prospective Vendors can develop a bid for constructing the remedial system using the information from the RDP, and that the Vendor awarded the project for construction can accurately construct the remedial system using the RDP. The Vendor must incorporate the minimum standards for remedial equipment as outlined in Attachment J.
- 3.3.1.4 The Vendor is responsible for meeting the RDR and RDP goals outlined in this section and Section 4.0, Deliverables.

#### **3.3.2 Report and Design Plan Criteria**

- 3.3.2.1 If specified in EXHIBIT 1, Site Specific Information, conduct additional investigatory work prior to development of the RDR and the RDP. The work must be performed in accordance with all criteria outlined in this document. It is the responsibility of the Vendor to conduct

a thorough site visit to identify all potential source areas and make sure that they have been investigated. Soil borings and additional monitoring wells have been included in order for the Vendor to confirm all source areas prior to development of the RDR/RDP.

- 3.3.2.2 If specified in EXHIBIT 1, Site Specific Information, conduct pilot tests, soil vapor extraction test, and/or an air sparge test.
- 3.3.2.3 Test procedures outlined in this document are for guidance purposes only. It is the responsibility of the vendor to provide standard operating procedures to KDHE for each test specified in EXHIBIT 1, Site Specific Information. (Section 4.3-Proposal Submittals)
- 3.3.2.4 The RDR will include all data collected from additional investigatory and remedial work with a recommended remedial technology based upon this data.
- 3.3.2.5 The RDR will include, at a minimum, pilot test results, analytical data, cross sections, isoconcentration maps, and proposed remedial technologies with adequate documentation of remedial effectiveness and cost effectiveness. **Past experience with similar systems is not considered adequate justification for implementing a proposed remedial technology.**
- 3.3.2.6 The Remedial Design Plan will include complete plans and specifications for the entire remedial system.
- 3.3.2.7 The plans and specifications will include, at a minimum, a site plan, process and instrument diagrams, construction details including piping and trenching, electrical schematics, and all other plans and specifications that are necessary to properly construct and implement the remedial system in accordance with the RDP and in accordance with NEC Class I Division II electrical requirements.
- 3.3.2.8 The Field Geologist will be on-site and oversee all drilling activities and perform hydrologic testing activities. The Field Geologist will evaluate, describe, and record the soil, sediments, and lithology, moisture content, odor, and all other observations related to the geology of the site and contamination detected during drilling activities.
- 3.3.2.9 All data collected during this phase of work will be evaluated by the Project Geologist, and/or Project Engineer.
- 3.3.2.10 The RDP will be developed by the Project Engineer. The Project Engineer must sign, date, and seal the RDP plans and specifications as specified in K.S.A..

### 3.3.3 Soil Vapor Extraction Test

- 3.3.3.1 *Unless otherwise specified* in EXHIBIT 1, Site Specific Information, for most applications, install a soil vapor extraction (SVE) test well with a minimum inside casing diameter (ID) of 4 inch, with the screen sized appropriately for site conditions be used. All SVE and observation well(s) must be completed in accordance with the requirements outlined in Section 3.4.
- 3.3.3.2 If specified in EXHIBIT 1, Site Specific Information, install soil vapor extraction observation well(s) with an I.D. of two inches or larger. The well(s) must be installed in accordance with the requirements outlined in Section 3.4.
- 3.3.3.3 The SVE test should be planned for a period of eight hours or as deemed necessary by the Design Engineer and/or the KDHE Project Manager. Where possible, several extraction wells and air flow rates / vacuum combinations should be utilized during the test. The KDHE Project Manager must be notified for tests conducted less than eight hours. The

reimbursement will be pro-rated to the line item for the actual length of the test.

- 3.3.3.4 Determine the following unsaturated zone characteristics: permeability of soils to air, vapor flow rate, zone of remediation (horizontal and vertical pressure gradients), effluent contaminant levels, and the feasibility of in situ soil remediation techniques at the site. Field personnel must obtain a sample prior to the dilution valve to analyze for O<sub>2</sub> concentrations in the extracted soil gas to determine if the well has short circuited to the surface.
- 3.3.3.5 Flow measurements must be taken in the field using an in-line flow meter, pitot tube or other similar flow measuring device. This measurement should be taken in line, up stream of any vacuum relief valve, sample port, etc. Blower performance curves are not acceptable for basis of design and should be used only for comparison with field readings. All flow measurements must be reported in scfm.
- 3.3.3.6 Flow rates must be measured between the SVE test well and the blower system, prior to the dilution valve. The percentage of bypass air (dilution) will be measured and included in the report.
- 3.3.3.7 The Contractor must insure that the vacuum gauges are calibrated to atmospheric conditions prior to the start. The measured values should be adjusted by subtracting the initial readings. A background manometric must be open to the atmosphere to measure any changes in barometric pressure during the duration of the test. Any deviation of ambient barometric pressure changes during the test must be reported in the field notes, corrected in the tables, and in the text.
- 3.3.3.8 If an SVE test well and/or observations wells are installed, the well gravel pack and screen must be sized and located to insure the characteristics of the unsaturated zone are determined during the test. The SVE wells will be grouted with neat cement or other grout approved by the KDHE Project Manager .
- 3.3.3.9 If an SVE test well and/or observation wells are installed, at least one test well shall be installed in the area determined to have the highest level of soil contamination.
- 3.3.3.10 The SVE test shall be conducted in such a manner that all unsaturated zone characteristics are fully determined.

### **3.3.4 Air Sparge test**

- 3.3.4.1 If specified in EXHIBIT 1, Site Specific Information, install an air sparge (ASP) injection well with an inside diameter (I.D.) casing of a minimum of one inch or larger. The well must be completed in accordance with the requirements outlined in Section 3.4 with the exception that the top of the screened interval shall be a minimum of five feet below the seasonal low static water table and a minimum of five feet below the depth of soil contamination.
- 3.3.4.2 If specified in EXHIBIT 1, Site Specific Information, adapt the SVE wells to serve a dual role for an air sparge system (ASP) test. The SVE wells will be used to measure increases in soil gas VOC concentration levels and pressure changes in the vadose zone near the sparging well. Air samples from each vadose observation well will be measured at least every hour for VOC concentrations using photoionization detector, organic vapor analysis device, colorimetric tubes, or other field testing equipment approved by KDHE.
- 3.3.4.3 If specified in EXHIBIT 1, Site Specific Information, install two ASP observation wells within the expected radius of influence of the sparging point.
- 3.3.4.4 The ASP observation wells shall be placed at the same depth as the sparging well. The ASP

observation wells will be equipped with a maximum of 36 inch long screens.

- 3.3.4.5 The ASP observation wells will serve as monitoring points to measure increases in dissolved oxygen, pressure, and VOC concentrations.
- 3.3.4.6 One well outside the expected air sparge radius of influence will be designated as a background well. All field measurements will be taken and recorded from this well at the same frequency as the observation wells.
- 3.3.4.7 Air flows must be reported in scfm. Injection pressures, and observation well pressures in psi.
- 3.3.4.8 The air injection flow rate shall be a maximum of 5 scfm unless otherwise approved by the KDHE project manager..
- 3.3.4.9 All receptors (i.e., existing monitoring wells, streams, ponds, utility trenches, storm sewers, basements, etc.) proximate to the site will be monitored for indications of sparging effects (air bubbles, fumes, localized mounding above the sparging point).
- 3.3.4.10 The ASP test shall be conducted for a total period of 8 hours, and shall run concurrent with SVE test or as approved by the KDHE Project Manager.
- 3.3.4.11 Determine the following aquifer characteristics: air-entry flow pressure, air-flow rate, radius of influence of sparging, the sparging vapor concentrations, and the feasibility of ASP remediation techniques at the site.
- 3.3.4.12 If an ASP test well and/or observation wells are installed, the well(s) must be installed within the contaminant plume to insure that the aquifer characteristics of the area to be remediated are determined.
- 3.3.4.13 If an ASP test well is installed, the well gravel pack and screen must be sized and located to insure the characteristics of the saturated zone are determined during the test. The ASP wells will be grouted with neat cement or other grout approved by the KDHE Project Manager. All grout will be placed by the tremie method.
- 3.3.4.14 If an ASP injection test well is installed, the well shall be installed closely centered within the radius of influence of the SVE extraction well(s).

### **3.3.5 Remedial Design Plan Sampling and Analytical**

- 3.3.5.1 Prior to initiation of field activities, measure static water level, and collect a representative groundwater sample from each monitoring well and water well; i.e., public, private, etc., located within a 500 foot radius of the groundwater contaminant plume. These groundwater samples will be collected within the same sampling event and will be analyzed on a 24 hour turnaround basis, or as specified by the KDHE Project Manager. New monitoring well locations will be finalized after the ground water analytical results have been received and reviewed by the consultant and the KDHE Project Manager.
- 3.3.5.2 A representative groundwater sample and static water level will be collected from each monitoring, observation, and aquifer test well installed during all phases of work and from each water well; i.e., public, private, etc., located within a 500 foot radius of the contaminant plume. These groundwater samples will be collected within the same sampling event. At the discretion of the KDHE Project Manager, those wells sampled prior to drilling activities may not be re-sampled
- 3.3.5.3 Discrete groundwater samples will not be collected for laboratory analysis if separate phase

hydrocarbons are present in the well. The Vendor shall document the complete description of the separate phase hydrocarbons including thickness of the separate phase layer, color, odor, viscosity, and indicate the type of product suspected.

- 3.3.5.4 At the start of the SVE test and every three hours thereafter, (start, 3hrs., 6hrs., 8hrs.), or as approved by the KDHE Project Manager, a representative air sample will be collected from the air effluent during the test and analyzed by a laboratory for the constituents outlined in the Project Bid Proposal Sheet (EXHIBIT 2).
- 3.3.5.5 Immediately prior to completion of the SVE test, an air sample will be collected from the air effluent and analyzed by a laboratory for the constituents outlined in the Project Bid Proposal Sheet (EXHIBIT 2).
- 3.3.5.6 Air samples will be collected for field analysis once every hour during the SVE test and analyzed using a photoionization detector, organic vapor analysis device, colorimetric tubes, or other field testing equipment approved by KDHE for hydrocarbon analysis.
- 3.3.5.7 Air samples will be collected for field analysis once every hour during the ASP test from each ASP observation well and analyzed using a photoionization detector, organic vapor analysis device, colorimetric tubes, or other field testing equipment approved by KDHE for hydrocarbon analysis.
- 3.3.5.8 Air samples must be containerized immediately in a cooler to prevent VOC destruction from exposure to sunlight.
- 3.3.5.9 All laboratory analysis will be performed by a laboratory certified by KDHE for the specific analysis and laboratory method as outlined in ATTACHMENT C. **Maximum holding time for air samples is 72 hours.**
- 3.3.5.10 All samples designated for laboratory analysis will immediately, upon collection, be containerized and sealed in a laboratory approved sample container for the constituent of concern, and will be properly preserved and transported to the laboratory.

### 3.3.6 FULL SITE SURVEY AND MAP

- 3.3.6.1 The full site survey must be conducted by a Registered Land Surveyor (RLS). The work product will be developed using standard survey equipment and standard industry practices.
- 3.3.6.2 A site benchmark will be established. The site benchmark will be sited within the property boundaries of the facility under study. The site benchmark will be a **permanent** mark (survey bolt, cross-cut, etc.) on a **permanent** site structure, such as a building foundation. Concrete pads or survey pins associated with wells or soil borings cannot be used as the site benchmark.
- 3.3.6.3 A site survey map will be prepared from the site survey data. The location of the site benchmark will be indicated on the site survey map. The map will show the actual locations of all site features, including, but not limited to, buildings, trenches for remedial lines, remedial equipment, soil vapor extraction wells, air sparge wells, monitoring wells, roads and driveways (center lines indicated), underground and overhead utility lines and manholes, storm sewer catch basins, above ground and underground storage tanks, fuel dispensers, fuel supply lines, paved areas, gravel areas, grassy areas, bridges, culverts, trees, fences, etc. The elevations of the permanent measuring point marked on the top of well casings and survey bolts on well pads will be measured to within .01 feet. Northings and Westings also will be measured to .01 feet. Flow directions for sewer and water lines will be indicated by arrows on the site map.
- 3.3.6.4 Buildings and other rectangular structures will be located by surveying a minimum of two corners, and the dimensions measured. Free-standing cylindrical structures should

be located by two points and the diameter stated. Grain elevators on pads and above ground storage tanks within a containment structure can be located by measurements from the pad edge or containment walls. The material, wall height, and measured dimensions of above ground storage tank containment structures will be recorded. Dimensions of all areas will be measured, and the type of paving material indicated.

- 3.3.6.5 The surveyor's report will include at a minimum:
- all field notes
  - tabulated latitude and longitude of all monitoring wells, soil vapor extraction wells, and air sparge wells
  - tabulated Northings and Westings of all monitoring wells, soil vapor extraction wells, and air sparge wells
  - tabulated elevation of permanent measuring points on well casings and survey pins associated with soil vapor extraction wells, air sparge wells, and monitoring wells
  - a full site survey map which indicates North arrow, map scale, and legend. The map will meet the above listed requirements.
- 3.3.6.6 The site survey map must bear the signature and seal of the RLS. A copy of the survey field notes must be included in the survey report.

### **3.3.7 Permits**

- 3.3.7.1 The Vendor is fully responsible for obtaining all permits and authorization necessary to develop the RDP.
- 3.3.7.2 The Vendor will not be responsible for obtaining construction and electrical permits.
- 3.3.7.3 The Vendor is fully responsible for filing and obtaining all local, state, and federal easements and permits necessary to implement the RDP, and operate the remedial system.
- 3.3.7.4 All permits and easements that are necessary to implement and operate the remedial system must be filed with the appropriate local, federal, or state agency. Copies of the permit applications and all correspondence to and from each agency must be submitted to the O/O and the KDHE Project Manager.
- 3.3.7.5 Upon receipt of all permits and easements, the Vendor must submit a copy of each to the O/O and the KDHE Project Manager. All permits must be obtained in a timely manner.
- 3.3.7.6 If excavation and landfarming is part of the Remedial Design Plan (RDP), see Attachment K. A copy of the Application to Landfarm Petroleum Contaminated Soils and a summary of some of the information that must be included are included as Attachment K. A comprehensive list of information required is included in the landfarm application.

### **3.3.8 Property Access**

- 3.3.8.1 The Vendor is responsible for contacting facility managers, lessee, and tenant, and/or current property owner, all on-site, and off-site property owners to obtain access for all field activities conducted at the facility. Contact will be verbal and in writing. Written permission will be obtained from each owner of the property that is necessary to access and must be submitted to KDHE Project Manager prior to any field activities. A copy of the access agreement, signed by both the Owner Operator of the facility, as well as the owner of the property must be submitted to the KDHE Project Manager prior to any well installation/soil boring activities.

- 3.3.8.2 The Vendor must contact the Owner/Operator and tenant (if different) prior to mobilizing for any field activity.
- 3.3.8.3 For off-site access, the Vendor should utilize city and utility easements when appropriate and necessary. Written permission to drill in city and utility easements must be obtained prior to equipment mobilization. In such cases, the Vendor must obtain written permission from both the property owner and the entity granting the easement. Copies of all signed access agreements should be included in the workplan.
- 3.3.8.4 The Vendor is expected to act in a professional and respectful manner to any local and agency authorities, utility companies, and the public in general when requesting access.
- 3.3.8.5 A compensation amount may be payable to off-site owners (see ATTACHMENT I for payment schedule); this amount will be eligible for reimbursement from the Trust Fund.
- 3.3.8.6 If authorization for property access is denied, contact the KDHE Project Manager.
- 3.3.8.7 The Vendor must submit a map verifying Owner/Operator (O/O) (and tenant if different) approval of the location of the remedial trenching and equipment. This map will include the exact location of trenching and equipment enclosure and must signed and dated by the O/O and/or tenant and Project Engineer.

### **3.3.9 Property Restoration**

- 3.3.9.1 Photographs submitted in digital format must be taken to photo-document the site conditions prior to starting any field activity at the location. After construction is completed, another series of photographs must be taken to document all site restoration. Photographs will be made of onsite parking surfaces, drive ways, curbs/sidewalks, grass areas, buildings/foundations, and all secondary containment structures. Foundations and retaining walls located within 50 feet of any excavations will also be digitally photographed.
- 3.3.9.2 Any property damaged or destroyed during implementation of the project must be repaired to its original condition within 30 calendar days after the damage or destruction has occurred. Failure to restore the property to (at least) original condition could result in disqualification from KDHE Trust Fund work.
- 3.3.9.3 If any landscaped areas are disturbed during construction activities, the Vendor must contract with a Landscape Professional. Documentation of contract will be required.

## **3.4 ADDITIONAL INVESTIGATORY WORK**

### **3.4.1 General Information**

- 3.4.1.1 Additional investigation will only be conducted if required in the Site Specific Information in EXHIBIT 1.
- 3.4.1.2 Conduct all additional investigation prior to conducting the work for the Remedial Design Plan, and in accordance with the specifications outlined in this Section of the RFP.

### **3.4.2 Drilling Equipment and Methods**

- 3.4.2.1 Hollow stem augers with a minimum diameter (ID) of 4.25 inches must be used for all drilling activities unless alternate drilling methods have been approved by KDHE in writing.
- 3.4.2.2 It is the full responsibility of the Vendor to evaluate the site specific geology and other

relevant information and determine the drilling method(s) necessary to meet the requirements of the contract at this site.

If it is necessary to change the drilling method, the Vendor will submit in writing to the KDHE contact person a description of the proposed change. The request must be submitted under separate letter from the Vendor. KDHE will review the information and provide the Vendor with a written response authorizing or denying the proposed change. All costs associated with the change will be the responsibility of the Vendor.

In some cases, wells must be completed by mud rotary or bucket auger drilling methods. The consultant must factor into the bid all costs related to well completion and disposal of drilling fluids and drill cutting wastes. All mobilization costs related to performing multiple drilling methods for the installation of the wells must be included.

- 3.4.2.3 The selected drilling methods and equipment must be capable of completing the wells to the depth required without causing the migration or dilution of contamination.
- 3.4.2.4 For hollow stem auger drilling, if static groundwater level is 40 feet deep or less, the drill rig using hollow stem augers must have a minimum of 3,000 foot pounds of torque. If the static water level is greater than 40 feet deep and less than 70 feet deep, the drill rig using hollow stem augers must have a minimum of 5,500 foot pounds of torque. If the static groundwater level is greater than 70 feet deep and less than 100 feet deep, the drill rig must have a minimum of 7,000 foot pounds of torque. If the static groundwater level is greater than 100 feet deep, the drill rig using hollow stem augers must have a minimum of 10,000 foot pounds of torque.

### 3.4.3 Drilling and Sample Collection Procedures

- 3.4.3.1 The minimum borehole diameter of any well constructed for an RDR/RDP must be 8" or four inches larger than the outside diameter of the casing whichever is larger.
- 3.4.3.2 A Project and/or Field Geologist will be on-site and oversee all drilling activities. The Project Engineer or Project Geologist will be either onsite to perform all hydrologic and pilot testing activities or oversee the Field Geologist during the completion of the test(s). The Project and/or Field Geologist will evaluate, describe, and record the lithology, moisture content, odor, and all other observations related to the geology of the site and contamination detected during drilling activities.
- 3.4.3.3 Discrete soil samples will be collected every five feet for the first fifty feet of drilling and every ten feet thereafter using split spoon, Shelby tube, or continuous samplers. No composite samples will be allowed. All soil samples will be collected in this manner until groundwater is encountered. If alternate drilling methods such as rotary drilling are approved for installing four-inch or larger wells, collection of discrete drilling samples for field screening and laboratory analysis will be up to the discretion of the KDHE project manager.
- 3.4.3.4 During the discrete soil sampling process, duplicate soil samples will be collected from each discrete soil sample. One of the samples will be placed in the appropriate sample container for analysis in the field, the other sample will be placed in the appropriate sample container for laboratory analysis **if required**.
- 3.4.3.5 Project Geologist will stamp and sign the Remedial Design Report verifying that all the above drilling and sampling procedures were followed as specified in this RFP.

### 3.4.4 Wells

- 3.4.4.1 The wells will be installed by a KDHE licensed water well contractor using hollow stem

augers or other approved drilling methods.

- 3.4.4.2 All AS wells will be drilled by rotary auger method unless otherwise approved by the KDHE Project Manager. If hollow stem drilling is approved, the contractor must use coated bentonite pellets for completions below static level.
- 3.4.4.3 All SVE and onsite MW's will be 4 inch wells unless otherwise directed by the KDHE project manager.
- 3.4.4.4 Bentonite drilling mud will NOT be allowed for any remedial well utilizing the mud rotary drilling method. Native mud is the preferred medium of mud rotary drilling however, polymer drilling materials will be acceptable providing they are both biodegradable and non-polluting. The Vendor must explain in the work plan the drilling medium to be used and the procedures they will use in developing these wells. The Vendor must receive written approval from the KDHE project manager before drilling activities can begin and will be responsible for wells that are constructed incorrectly and or inadequately developed.
- 3.4.4.5 All monitoring wells and remedial wells must be securely covered until completed.
- 3.4.4.6 All well completions will meet or exceed the design specification as provided in EXHIBIT 1 with the following exceptions:
  - 1) The screen seal will be a two foot layer of hydrated bentonite ( granular, chips, or pellets). The seal will be hydrated with at least one gallon of water for every 6" and completed in 6" lifts.
  - 2) Wells where the screen seal is less than or equal to 40 feet bgs will be grouted with hydrated bentonite as described in #1 above or with a flowable bentonite or cement bentonite grout via tremie.
  - 3) All wells greater than 40 foot bgs will be grouted by a flowable bentonite grout, cement bentonite or neat cement grout. All grouting will be completed by pumping grout through a tremie pipe with a diameter smaller than the well casing and from the screen seal up. Hydrated bentonite (granular, chips or pellets) are NOT considered grout.
  - 4) It is the responsibility of the Vendor to ensure that the weight and consistency of the grout is designed for the application, lithology, and depth of the well. Deeper wells must be grouted in lifts.
  - 5) Any changes to this design must be approved by the KDHE Project Manager in writing, once justification has been supplied to cause a variance from the original design. Flush-mounted wells require a variance from the KDHE Bureau of Water.
- 3.4.4.7 The required minimum screen length is outlined in EXHIBIT 1. For monitoring wells, the screen shall be placed such that the well could be utilized as a vapor extraction well. Questions concerning screen length can be answered by the KDHE Project Manager.
- 3.4.4.8 Although an estimated or approximate depth to groundwater has been provided, the Vendor will be fully responsible for determining the actual depth to groundwater and completing the well(s) to the appropriate depth. Failure to complete the well at the appropriate depth will result in the Vendor having to re-drill the well without the benefit of reimbursement by the trust fund.
- 3.4.4.9 All newly installed SVE/AS wells that intersect the groundwater must be properly developed and purged prior to remediation startup. Development of the well may be accomplished by the Mechanical Surging (Bailer or Surge Block) Method, or the Surge-

Pumping Method. Development of wells that are completed in fine sand and silt sediments should consist of a compatible method so that fine-grained materials will not accumulate into the filter pack. Well development documentation must include confirmation that a minimum of 5-10 well volumes and all silts, clays, or sediment created during the drilling process inside the casing have been removed. Failure of the Vendor to remove all the sediment inside the well will result in the denial of the appropriate footage charges and/or the complete well charges. The Vendor would then be responsible for re-drilling a new well without the benefit of reimbursement by the trust fund.

SVE/AS wells may not be utilized for startup or pilot testing activities until a minimum of 72 hours has elapsed following completion.

All monitoring wells must be properly developed and purged prior to sampling according to SOP BER-01. If wells are not sampled immediately following development, three casing volumes must be purged prior to sampling. Groundwater wells must be allowed to return to static levels before sampling.

In low yield wells, the Vendor must allow the groundwater to return as close as possible to static conditions before taking a groundwater sample for analysis. If static conditions are not attained or if 3 well volumes of water cannot be purged before groundwater samples are taken, the Vendor must document the reasons and include that information as part of the field notes and on Table 2.5, Groundwater Analytical Results.

- 3.4.4.11 Soil borings exhibiting soil contamination to groundwater should be completed as SVE wells and are to be utilized (when possible) in the Remedial Design Plan. The determination of soil contamination will be based on field analysis, odor, or visual inspection of each sample collected. Any questions on location of screen should be brought to the attention of the KDHE Project Manager.

### **3.4.5 Waste Disposal and Borehole Plugging**

- 3.4.5.1 Soil borings not completed as monitoring wells will be plugged in accordance with all state regulations and guidelines as outlined in ATTACHMENT B.
- 3.4.5.2 Waste soils and waste water generated during the additional investigatory work, remedial work, and pilot tests will be treated and disposed in accordance with all local, state, and federal statutes and regulations.
- 3.4.5.3 The Vendor is responsible for contacting the appropriate agencies to obtain disposal approval of waste soil and waste water generated. Contact will be verbal and written.

### **3.4.6 Field and Laboratory Soil Sample Analysis**

- 3.4.6.1 A headspace analysis will be conducted on all discrete samples collected in the field. The analysis will be conducted using a photoionization detector, organic vapor analysis device, colorimetric tubes or other field testing equipment approved by KDHE for hydrocarbon analysis.
- 3.4.6.2 Each discrete sample collected for field analysis will be prepared as follows: fill a clean quart jar half full of the discrete sample to be analyzed, seal the jar and let it stand until the sample reaches 70°F for a minimum of 15 minutes (allowing volatilization to occur) prior to testing.
- 3.4.6.3 At the discretion of the KDHE Project Manager, soil samples may be collected and sent for laboratory analysis from each borehole at the source area.

- 3.4.6.4 If lab analysis of soil samples is requested by the KDHE Project Manager, the soil sample(s) submitted for laboratory analysis will be the duplicate of the sample(s) showing the highest field analysis reading(s) within the borehole or at the location designated by the KDHE Project Manager
- 3.4.6.5 All laboratory analysis will be performed by a laboratory certified by KDHE for the specific analysis and laboratory method as outlined in ATTACHMENT C.
- 3.4.6.6 All samples designated for laboratory analysis will immediately, upon collection, be containerized and sealed in a laboratory approved sample container for the constituent of concern, and will be properly preserved and transported to the laboratory.
- 3.4.6.7 At any site that is a candidate for soil excavation and landfarming, samples from monitoring and/or test well installation must be analyzed for total lead. These readings are to be obtained from at least one well in the source area or other area(s) where excavation is planned. Up to four samples may be sent for analysis. Samples to be sent should be from zones of greatest contamination as determined by field readings (gasoline range) and/or sight and odor for heavier range hydrocarbons. A background lead sample should also be taken from a well that has non detectable levels of the contaminant of concern, such as a up gradient well.

## **SECTION 4.0 DELIVERABLES**

### **4.1 WORK NOTIFICATION REQUIREMENTS**

- 4.1.1 The Vendor will notify the O/O, the KDHE Project Manager, and the appropriate KDHE District Office, by telephone or in writing, in advance (preferably seven days) of starting drilling. The notice will include the date and time the drilling is scheduled to begin.
- 4.1.2 The Vendor will notify the KDHE Project Manager and the appropriate KDHE District Office, by telephone or in writing, 72 hours in advance of conducting the hydrologic tests. The notice will include the date and time the tests will be performed.
- 4.1.3 The Vendor will notify the O/O and the KDHE Project Manager, by telephone or in writing, when all drilling activities and hydrologic tests have been completed. The notification will include the date field work was completed. This notification must be within five working days after the work is completed.

### **4.2 DEADLINES AND NOTICE TO PROCEED**

- 4.2.1 The Vendor will complete and submit the Remedial Design Work Plan Worksheet (see ATTACHMENT E) to KDHE within 30 days after the contract between the O/O and Vendor has been signed by all parties. All due dates are based off the contract sign date.
- 4.2.2 KDHE will review the Remedial Design Work Plan Worksheet and provide written comment, or if approved, written authorization for the Vendor to proceed with field activities within twenty one (21) calendar days following the date KDHE receives the plan.
- 4.2.3 The Vendor may request from KDHE that written authorization to proceed be sent in the U.S. Mail to the Vendor's office at the address provided by the Vendor, or facsimile to the Vendor's office at a number the Vendor provides. Unless otherwise requested by the Vendor, written Notices to Proceed will be sent by U.S. Mail to the contact person provided by the Vendor in the RFP.
- 4.2.4 The Vendor will proceed with field activities after KDHE has approved, in writing, the Remedial Design Work Plan Worksheet.
- 4.2.5 The Vendor will submit the Remedial Design Report within 60 days after the Remedial Design Work Plan Worksheet has been approved, in writing, by KDHE.
- 4.2.6 KDHE will review the Remedial Design Report and provide written comment, or if approved, written authorization for the Vendor to proceed with the Remedial Design Plan within forty two (42) calendar days following the date KDHE receives the report.
- 4.2.7 The Vendor will submit the Remedial Design Plan within 60 days after the Remedial Design Report has been approved, in writing, by KDHE.
- 4.2.8 The Remedial Design Plan is due 213 calendar days after the contract is signed.
- 4.2.9 KDHE recommends a teleconference (or meeting) with the Vendor Project Manager, Design Engineer, and the KDHE Project Manager to discuss proposed remedial technologies prior to completing the design.

### **4.3 PROPOSAL SUBMITTALS**

The Vendor is required to submit as a part of the proposal each item requested in the order and format provided below. Certain items (\*) will remain on file with KDHE and once submitted, re-submittal will be necessary only when changes are made. The Vendor must specifically state each item omitted from the submittal package and include an explanation. Submit two copies of the Project Bid Proposal Sheets (Exhibit 2), with

Project Information Sheets attached.

- 4.3.1 A cover letter from the Vendor
- 4.3.2 Completed Project Bid Proposal Sheets
- 4.3.3 Copy of Insurance Certificate\*
- 4.3.4 Standard Operating Procedures for the following technical Procedures:
  - 4.3.4.1 Drilling and decontamination procedures\*
  - 4.3.4.2 Procedures for field analysis of samples\*
  - 4.3.4.3 Laboratory sample collection and handling methods\*
  - 4.3.4.4 Well development procedures\*
  - 4.3.4.5 Waste handling and disposal methods\*
  - 4.3.4.7 Unsaturated zone test methods description\*
  - 4.3.4.8 All other technical procedures described herein or proposed by the vendor\*
- 4.3.5 Resumes and OSHA safety training certification of personnel proposed for the project\*
- 4.3.6 Complete list of equipment\*
- 4.3.7 Drill Rig Specifications\*
- 4.3.8 Quality Assurance and Quality Control (QA/QC) plan\*
- 4.3.9 Field safety plan.
- 4.3.10 Workers Compensation Log & Summary of Occupational Injuries & Illness (OSHA form G200)
- 4.3.11 List of all sub-contractors with a description of their duties and, if applicable, copies of their OSHA safety training certificates. If the sub-contractor is to serve as the Vendor's Project Geologist or Project Engineer, a copy of their resume is to be submitted to KDHE indicating their qualifications as outlined in Section 1.3.9.

#### **4.4 REMEDIAL DESIGN WORK PLAN SUBMITTALS**

- 4.4.1 Submit two copies of the Remedial Design Work Plan Worksheet and maps. The Remedial Design Work Plan Worksheet is included in ATTACHMENT E. The Remedial Design Work Plan will be submitted in the format described herein and shall contain all requested information. Additional information should be included as needed.

#### **4.5 REMEDIAL DESIGN REPORT**

- 4.5.1 Submit two copies of the remedial design report (RDR). The RDR will be a comprehensive description of all work performed, data requested and information gathered during all activities conducted under this contract.
- 4.5.2 The RDR shall include a cover page with the following information: report title; site name; site address; KDHE project code; section, township, and range to four quarters; report date, the name of the name of the people who conducted the work for the report.

- 4.5.3 The RDR shall include a table of contents with the following information: 1) section titles (see 4.5.7 below) and page numbers of all sections 2) tables and page numbers and 3) list each Drawing, Figure, and Appendix.
- 4.5.4 The RDR shall include a labeled tab for each of the Section titles (see 4.5.7 below) and each appendix. Incomplete or improperly formatted reports will be returned for corrections.
- 4.5.5 Tables must be labeled with the numbers and titles provided. Include in the table a column for each numbered item requested. Abbreviations or material referenced from other publications should be explained at the bottom of the table.
- 4.5.6 All maps must be drawn to scale and labeled with the titles provided. The scale must not exceed 1 inch = 50 feet for smaller sites and 1 inch = 100 feet for larger sites. Include a north arrow, scale, and legend on all maps.
- 4.5.7 **Report Format:** The Remedial Design Report will include all information outlined below in the format and order described. The discussions should be concise. Use the Section titles and subtitles provided, and number each page.

## **SECTION 1.0 DISCUSSION**

### **1.1 Report Summary**

- 1) Provide a brief summary of the contamination detected. Include the extent, degree, migration, and any impact or potential impact to sensitive environments, or public and private water supplies.

### **1.2 Proposed Remedial Plan**

- 1) Provide a detailed description of the proposed remedial technology(ies).
- 2) Explain how the remedial system will operate once the RDP has been implemented.
- 3) Describe the areal extent of the aquifer, the recharge areas of the aquifer, and the aquifer boundaries and thickness. Explain how this information was determined and how it was applied in developing the remedial report.
- 4) Explain the expected time frame for addressing the contamination outlined in the Site Specific Information. Provide justification for this information. Past experience is not adequate justification for determining clean up time.
- 5) Explain the expected effectiveness of the proposed remedial technology(ies) relative to site conditions.
- 6) Explain the expected cost effectiveness of the proposed remedial technology(ies) relative to other technologies and to site conditions. Provide documentation for this information.

### **Table 1 Summary of Work Completed**

Include the following information for work completed during this phase of site work.

- 1) Total number of borings installed.
- 2) Total number of monitoring wells completed.
- 3) Total number of groundwater survey probes conducted.

- 4) Total footage drilled.
- 5) Total monitoring well footage.
- 6) Total boring footage plugged.
- 7) Total number of groundwater samples submitted for laboratory analysis.
- 8) Total number of soil samples submitted for laboratory analysis.
- 9) Type and number of aquifer tests and unsaturated zone tests conducted.

**Table 2 Well Completion Information**

Include the following information for each well installed or sampled during this RFP. Groundwater levels must be measured under static conditions on the same day, and measurements must be corrected if petroleum product is detected. If product is detected, explain at the bottom of the table how the measurements were corrected.

- 1) Boring ID number (assigned by the consultant).
  - 2) Well ID number (assigned by the consultant).
  - 3) The identification number from the KDHE well tagging Site I.D. forms.
  - 4) The surveyed elevation of the well's vertical datum control point (survey pin).
  - 5) The surveyed elevation of the well casing.
  - 6) The depth to groundwater (in feet) of each well.
  - 7) The static water level elevation of the well.
  - 8) The elevation of separate-phase product.
  - 9) The thickness of the separate-phase product.
  - 10) The date static water level was measured.
- 1) Screened interval

**Figure 1 Full Site Base Map**

A map which is the result of the full site survey includes the area of the contaminant plume as detected during this phase of work. Include and label the location of all groundwater probes, soil borings, and wells. Include the location of all buildings, roads, underground and aboveground utilities, present and past locations of all underground and aboveground storage tanks, pump islands, product lines, site surface conditions, and any other major structures in the area of the contaminant plume.

**SECTION 2.0 AQUIFER TEST RESULTS**

**2.1 Air Sparge Test Discussion**

- 1) Describe in detail how the air sparge test was conducted and why it was conducted in this manner.
- 2) Discuss all results obtained during the air sparge test.

- 3) Describe the aquifer characteristics determined and explain how they were determined.
- 4) Discuss the feasibility of air sparging at this site. Provide a brief discussion indicating whether data collected at the site confirms the use of this technology. Include all potential receptors proximate to the sparge points and discuss risk. Past experience at similar sites is not considered acceptable justification for implementing a technology.
- 5) If air sparging is proposed, provide the air-entry flow pressure and number of wells necessary to achieve the radius of influence needed to meet the remediation goals. Explain how this was determined.

**Table 3 Air Sparge Test Results**

- 1) Well ID number (see Table 2.2).
- 2) The field analyses of air over time in ppmv.
- 3) Air-entry flow pressure in psi.
- 4) Air flow rate in scfm.
- 5) Radius of sparging influence.
- 6) Dissolved oxygen levels in mg/l or ppm.
- 7) Pressure readings in observation wells

**2.2 Air Sparge Data**

Include all raw data (air sparge test data, plots of graphical analyses, grain size distribution plots, etc.) and calculations used to determine the aquifer characteristics. Identify the variables and provide the calculated or assigned values.

**Table 4 Groundwater Analytical Results**

Include the following information for each groundwater sample and separate phase hydrocarbon sample collected for laboratory analysis to date at the site. **Include all past samples collected and analyzed.** Present all results for each sample point in historical chronological order.

- 1) Well ID number (see Table 2.2).
- 2) The concentrations of each specified constituent in parts per billion (ppb).
- 3) The type of product identified for the separate phase hydrocarbon sample.
- 4) The volume of water removed during well development.
- 5) The volume of water purged from the well prior to sampling.
- 6) The date the well was purged.
- 7) The date each sample was collected.
- 8) The EPA testing method and laboratory analytical detection limit.

## **Figure 2 Groundwater Isoconcentration Maps**

Develop all groundwater isoconcentration maps that are outlined below and in EXHIBIT 1, Site Specific Information using the most recent analytical data. Use Figure 1 as the template. Sample points shall be labeled with concentrations in ppb. Each isoconcentration map shall include the location of all monitoring wells and sampling points. Isocontour lines shall be labeled with concentrations in ppb. Develop isoconcentration maps only if the constituent is detected in three or more sampling locations.

- 2.1 Total BTEX groundwater
- 2.2 Benzene
- 2.3 MtBE
- 2.4 Naphthalene (if necessary)
- 2.5 1,2 Dichloroethane (if necessary)
- 2.6 Polynuclear Aromatic Hydrocarbons (if necessary)
- 2.7 Ethylene Dibromide (if necessary)

## **Figure 3 Groundwater Flow Map**

A map, adapted from Figure 1, depicting each well location and showing the elevation of water levels in each well using the most recent data collected under static conditions, labeled equipotential contours, and arrow(s) indicating predominant flowpaths and direction.

### **2.3 Separate Phase Product Discussion**

- 1) Describe the extent of separate phase product encountered at the site. Include any product detected during previous investigations.
- 2) Provide an estimation of recoverable separate phase product based upon data obtained during all phases of the project.
- 3) Discuss the feasibility of product recovery at this site. Provide a brief discussion indicating whether data collected at the site confirms the use of this technology. Include all potential receptors proximate to the product plume and discuss risk. Past experience at similar sites is not considered acceptable justification for implementing a technology.
- 4) Provide the number of recovery wells necessary to meet the remedial goals. Explain how this was determined.

## **Figure 4 Separate Phase Product Isopach Map**

Develop all isopach maps utilizing Figure 1 as the template. Each isopach map shall include the location of all monitoring wells or sampling points. Develop an isopach map any time separate phase product has been detected.

## **SECTION 3.0 UNSATURATED ZONE TEST RESULTS**

### **3.1 Soil Vapor Extraction Test Discussion**

- 1) Describe in detail how the soil vapor extraction test was conducted and why it was conducted in this manner.

- 2) Discuss all results obtained during the soil vapor extraction test.
- 3) Describe the unsaturated zone characteristics determined and explain how they were determined.
- 4) Discuss the feasibility of soil vapor extraction at this site. Provide a brief discussion indicating whether data collected at the site confirms the use of this technology. Include all potential receptors of SVE exhaust and discuss options for off-gas treatment. Past experience at similar sites is not considered acceptable justification for implementing a technology.
- 5) If SVE is proposed, provide the extraction rates and number of wells necessary to create zones of remediation needed to meet the remedial goals. Explain how this was determined.

**Table 5 Soil Vapor Extraction Test Results**

- 1) Well ID number (see Table 2.2)
- 2) Elevation of site (ft above MSL)
- 3) The laboratory analysis of the SVE effluent for each specified constituent over time in parts per million volume (ppmv)
- 4) The field analyses of the SVE effluent over time in ppmv
- 5) Airflow rate from the SVE extraction well during test
- 6) The permeability of soils to air
- 7) Radius of influence of SVE extraction well
- 8) Diameter of SVE extraction well
- 9) Screened interval of the SVE extraction wells and observation wells
- 10) Length of exposed screen in the SVE extraction well during test
- 11) Vacuum pressure at wellhead
- 12) Vacuum pressure at observation wells
- 13) Distance from SVE to observation well.

**3.2 Unsaturated Zone Data**

Include all raw data (laboratory tests, grain size distribution plots, soil vapor extraction test data, etc.) and calculations used to determine the unsaturated zone characteristics. Identify the variables and provide the calculated or assigned values.

**Table 6 Soil Field Screening and Laboratory Results**

Include the following information for each soil sample collected to date at the site. **Include all past samples collected and analyzed.** Present all results for each sample point in chronological order.

- 1) Boring and/or monitoring well ID (see Table 2)

- 2) The depth each sample was collected from
- 3) The field screening results in parts per million (ppm) for every sample, including samples not sent for laboratory analysis
- 4) The concentrations of each constituent in parts per million (ppm)
- 5) The date each sample was collected
- 6) The EPA testing method and laboratory analytical detection limit
- 7) The field instrument used for each sample

#### **Figure 5 Zone of Remedial Influence Map**

Use Figure 1 as a template to develop a map that depicts the areal zone of influence of all SVE, and air sparging systems proposed, differentiating each system.

#### **Figure 6 Soil Isoconcentration Maps**

Develop all soil isoconcentration maps that are outlined below and in EXHIBIT 1, Site Specific Information using all available soil analytical data. Use Figure 1 as the template. Sample points shall be labeled with concentrations in ppm. Each isoconcentration map shall include the location of all monitoring wells and sampling points. Isocontour lines shall be labeled with concentrations in ppm. Develop isoconcentration maps only if the constituent is detected in three or more sampling locations.

- 1) Benzene
- 2) TPH

### **SECTION 4.0 GEOLOGIC CROSS SECTIONS**

#### **Figure 7 Geologic Cross Section - A**

A geologic cross section plotted relative to actual mean sea level elevations of monitoring wells, of the area with the highest level of soil contamination at the site based on all available data. Each cross section must include the following information using a minimum of three data points:

- 1) soil profile lithological units of each well and boring;
- 2) all field screening data, laboratory analytical results and product thickness plotted relative to associated depths;
- 3) location of SVE/AS and monitoring wells located within the area of the cross section with screened interval shown;
- 4) potential receptors or flowpaths for contaminant/vapor migration during system operation;
- 5) vertical and horizontal bar scales with vertical exaggeration noted;
- 6) lithologic legend using standard geologic soil/lithology symbols; and
- 7) reduced map of the site with wells and borings plotted that depicts the orientation and labeled reference points for the sections.

## **Figure 8 Geologic Cross-Section - B**

Include the same information that is required in Figure 5; however, representing a different cross sectional area of the site.

### **SECTION 5.0 DRILLING LOGS**

Include schematics for each boring drilled during this phase of the work. Do not make reference to, or include in this section, any discussion, tables, photographs, maps, or other documents included in this or any other report. The monitoring well completion must be included on the drilling log.

Drilling logs must be typed. Include a schematic for each drilling log. At a minimum, the following information must be included on each log:

- 1) The boring and monitoring well ID number.
- 2) Date and time drilling was conducted.
- 3) Name of the Driller and Geologist.
- 4) Detailed lithological descriptions corresponding to the depths measured during drilling activities. Include the color, texture, sorting, size and shape of grains, and other pertinent information.
- 5) Observations such as fracturing or solution cavities, organic content, staining, odor, moisture changes, and other pertinent features.
- 6) Field screening results corresponding to depths measured.
- 7) Depth the saturated zone was encountered and elevation of the water table.
- 8) Monitoring well, aquifer test well and unsaturated zone test well construction which accurately depicts the depth of the screen, blank casing, filter pack, bentonite seal, grout seal, well-head completion, and the surveyed elevation of the top of the casing and the survey elevation of the pad. This information must be included on the drilling log.
- 9) Provide the type of drill rig, soil sampling equipment, and soil analyses equipment utilized.

### **SECTION 6.0 DOCUMENTATION**

Include all information requested in the following format.

#### **Appendix 1 KDHE Site Identification Forms**

Include all copies of the completed KDHE Site Identification Forms.

#### **Appendix 2 KDHE Water Well Records**

Include copies of the KDHE Water Well Records (form WWC-5) for each well installed.

#### **Appendix 3 Laboratory Data**

Include all analytical laboratory reports, QA/QC reports, and chain of custody documents.

#### **Appendix 4 Field Notes**

Include copies of all notes and drilling logs maintained in the field. Include a copy of the complete surveyor's report in this appendix.

#### **Appendix 5 Off-Site Waste Handling Documentation**

Provide documentation, indicating how wastes addressed off-site were handled and treated.

##### **Table 5 On-Site Waste Handling Results**

Include the following information for wastes handled.

- 1) The type of wastes generated (soil, water, etc.).
- 2) The quantity of waste generated for each type of waste.
- 3) The storage methods used for each type of waste.
- 4) The field analyses results of the wastes during the on-site treatment process.
- 5) The laboratory analyses of wastes.

#### **Appendix 6 Photographs**

- 1) Include copies of digital photo documentation
- 2) At a minimum, all surfaces which drilling equipment will be operated and driven should be photographed prior to moving drilling equipment on site.

#### **Appendix 7 Site Approval and Electrical Verification**

- 1) Include site map with trenching and equipment approval signed by the O/O, tenant, and Project Engineer.
- 2) Include electrical power verification map stamped, signed, and dated by the Project Engineer.

### **4.6 REMEDIAL DESIGN PLAN**

- 4.6.1 Submit two copies of the Remedial Design Plan. The Remedial Design Plan will provide all information that is necessary to implement the RDP, and construct and operate the remedial system.
- 4.6.2 Report must be stamped and signed by the Project Engineer and the Project Geologist.
- 4.6.3 The design plan shall include a cover page with the following information: report title; site name; site address; KDHE project code; section, township, and range to four quarters; report date, the name of the person who developed the design plan, and the name of the people who conducted the work for the design.
- 4.6.4 The design plan shall include a table of contents with the following information: 1) section titles (see 4.6.5 below) and page numbers of all sections 2) tables and page numbers and 3) list each Drawing, Figure, and Appendix.
- 4.6.5 The design plan shall include a labeled tab for each of the Section titles (see 4.6.5 below) and each appendix. Incomplete or improperly formatted reports will be returned for corrections.

**4.6.6 Report Format:** The Remedial Design Plan will include all information outlined below in the format and order described:

## **SECTION 1.0 CONSTRUCTION SPECIFICATIONS**

Provide detailed specifications for all construction. *All plans, specifications, drawings, and diagrams must meet local, state, and federal codes and regulations.*

### **1.1 Summary of Work and Special Conditions**

A brief description of the work to be conducted and a brief description of the remedial system.

### **1.2 Site Work**

The description and specifications for the site work necessary, including but not limited to, coordination with the Owner, special site conditions including utilities, obstructions, and a description of potential restoration and cleanup required for the successful implementation of the system.

### **1.3 Well Installation**

The specifications for all drilling on the project including but not limited to; materials, methods, special conditions, equipment, installation, testing, and completions.

### **1.4 Piping and Trenching**

The specifications for all piping and trenching including but not limited to; methods, materials, special conditions, installation, completions, and verification and testing.

### **1.5 Electrical**

All specifications and description of work for the electrical service including but not limited to; NEC rating, materials, boxes/enclosures, special conditions, and available service.

### **1.6 Electrical Power Verification**

The Vendor will provide a map of the area showing the location and type of power supply for the proposed remedial system. This map will depict the exact location of the existing power, the type of power, and distance to the proposed system. The Vendor must discuss future power needs with the appropriate local power company representative to determine both the lead time necessary to extend the power, and the cost to the extend the power to the proposed location. The Vendor must include the name and phone number of the power company representative, date of discussion, as well as the estimated cost to extend this power. This map will be signed, dated, and stamped by the Project Engineer.

### **1.7 Equipment**

All description of work, and specifications for remedial equipment including but not limited to, general information, materials, sizes/quantities, soil and groundwater remediation systems, equipment enclosure/trailer, control panel, telemetry system, installation, testing, and startup.

#### **1.7.1 Operation and Maintenance Schedule and Consumables**

Provide a complete service schedule for all equipment including the manufactures servicing recommendation for each piece of equipment. Provide a list of consumables for the two year period of OM&M as a parts list that will be included in the bid sheets (ie: rotary vane replacement kit, filters, belts, lubricants). Included with the consumables will be two each of the specified pressure gauges (vacuum and pressure).

## **1.8 Remedial Plans**

The plan drawings listed in items 1.1 through 1.6, inclusive, must be submitted with the report as specified. All drawings must be stamped and signed by the Design Engineer.

### **Drawing 1.8.1 Site Plan**

Provide a site plan drawn to scale with a north arrow that depicts the location of all fixed objects on the facility property, underground and aboveground utilities, the former and current UST basin(s), schematics of all remedial equipment and lines, and any other items pertinent to remedial implementation. Identify all major components of the remedial system and fixed objects on the facility property.

### **Drawing 1.8.2 Process and Instrumentation Diagrams (P&ID)**

Provide P&ID diagrams for all remedial equipment. Identify (type and size) and label all components.

### **Drawing 1.8.3 Equipment Drawings**

Provide completely detailed drawings, drawn to scale, of all buildings, enclosures, or security systems for the remedial equipment, and scale drawings of the remedial equipment.

### **Drawing 1.8.4 Electrical Diagrams**

Provide detailed diagrams and schematics of the electrical system and electrical lines. The wiring diagram must include, but is not limited to, type of power supply (phase, cycles, voltage, and amperage capacity); circuit breaker or fuse ratings; motor control sizes, controls, wire sizes, load for each branch of the circuit; interlocks; meters; remote controls, modems or logic control systems; and safety or alarm systems.

### **Drawing 1.8.5 Well Drawings**

Provide detailed drawings of all well completions. Include the subsurface completion of the well, terminal depth of each well type, the well head completion, and piping extending from the well to the remedial systems.

### **Drawing 1.8.6 Trenching/Piping Diagram**

Provide detailed drawings of all cross sections of the piping and trenching.

## **1.9 Design Calculations and Considerations**

Included in this section is all of the design and sizing calculations for all of the equipment.

## **1.10 Manufacture Specification Sheets for Installed Equipment**

This section includes manufactures' specification sheets for the specified equipment.

## **SECTION 2.0 OPERATION, MAINTENANCE, AND MONITORING SPECIFICATIONS**

This section includes specifications for the Operation and Maintenance (O&M) of the equipment, Monthly and quarterly monitoring specifications, reporting requirements, permitting requirements, and general information.

The Vendor must provide a list of consumables for the first two years of O&M and a schedule of manufacture recommended maintenance for this two year period as referenced in 1.6.1.

## **SECTION 3.0 REMEDIAL IMPLEMENTATION BID SHEETS**

The information presented in this section will be used in conjunction with the above information to obtain bids for remedial implementation (RI). Although general categories have been provided in each numbered item below, the bid proposal sheets must include specific detailed line items for each item that is anticipated within every category. This information must be presented in a complete list with columns for the item, unit rate, quantity, and cost. All equipment, supplies, parts, maintenance, and monitoring must be accompanied with the actual quantities necessary to implement the RDP.

### **4.7 POST-REMEDIAL DESIGN PLAN SUBMITTALS**

A release of liens must be provided to the O/O within 30 days of approval of the remedial design plan. A copy of this item must be submitted to the KDHE Project Manager within this same time frame. Approved permits must be submitted with the design.

## **SECTION 5.0 REIMBURSEMENT**

### **5.1 Reimbursement Guidelines**

- 5.1.1 All Vendor invoices must be submitted to the O/O for payment.
- 5.1.2 Total reimbursement will not exceed the lesser of the actual costs incurred for each line item or the total cost for each line item in the Project Bid Proposal Sheet unit pricing.
- 5.1.3 The Vendor will only receive payment for work conducted and accepted in accordance with the specifications outlined in this document.
- 5.1.4 Payment to the Vendor will be prorated in accordance with actual work performed (i.e. if only 50% of the scheduled drilling activities are required then 50% of the drilling activities will be reimbursed). The following categories will be prorated: Drilling Activities (excluding mobilization), Surveying, Hydrologic Tests, Waste Handling and Treatment, Sampling and Analytical, and Permits.
- 5.1.5 The Vendor may submit invoices for reimbursement at the following stages of the Project:

<b><u>Completion</u></b>	<b><u>Invoice Amt.</u></b>	<b><u>Pay Amount</u></b>
Work Plan	100%	90% of the invoiced amount. Work must be completed.
Drilling	100%	90% of the invoiced amount. Work must be completed.
Sampling and Analytical	100%	90% of the invoiced amount. Work must be completed.
Remedial Report, Remedial Design Plan, Permits	100%	90% of the invoiced amount. Work must be completed.

- 5.1.6 KDHE will review the Remedial Design Plan within thirty (30) calendar days and submit written comment to the Vendor, or if approved, the remaining 10% will be released when the permits have been obtained and copies of the permits have been submitted to the O/O and the KDHE Project Manager.

If KDHE fails to review the Remedial Design Plan and approve it or provide written comment within the thirty (30) calendar day time period, the remaining 10% will be automatically released if all permits have been obtained and submitted as outlined above.

### **5.2 Documentation Requirements**

- 5.2.1 Daily time sheet logs for all office and field activities must accompany all vendor invoices for services provided. Field time sheets must be signed by the Vendor on-site supervisor and the on-site O/O or O/O representative. Daily time sheet logs included in ATTACHMENT F will be used for this purpose.
- 5.2.2 Equipment usage log sheets, signed by the Vendor on-site supervisor and the on-site O/O or O/O representative must accompany vendor invoices.
- 5.2.3 Vendor invoices must be submitted in the same format as the Bid Proposal Sheets.

## **SECTION 6.0 PROPOSAL AND WORK SPECIFIC DEFINITIONS**

### **6.1 AIR SAMPLES**

This item shall include total cost associated with the collection and analysis of air samples taken (ie. purging, labor, equipment, shipping, etc.). All samples shall be analyzed in accordance with the criteria provided in this document for the constituents outlined in the bid sheet. **Maximum holding time of 72 hours.** Provide the per sample cost for analysis of each constituent indicated

### **6.2 AIR SPARGE TEST**

This items shall include all labor, equipment, materials, and any other costs that are necessary to conduct an air sparge test. The test will be conducted for a minimum of 8 hours. Reimbursement will not be provided for improperly conducted tests. KDHE reserves the right to alter the number of sparge tests or the length of time the test will be conducted at the site. This item shall be bid on an hourly rate and shall be reimbursed in accordance with the actual number of hours the test was conducted.

### **6.3 AIR SPARGE TEST SETUP AND DISMANTLE**

This item shall include all mobilization, labor, equipment, materials, and any other costs that are necessary to set-up and dismantle the ASP test. This shall be bid on a lump sum basis. KDHE reserves the right to alter the number of tests that will be conducted at the site.

### **6.4 BORING PERMITS**

This item shall include the cost charged by the local government entity for drilling or installing a soil boring or monitoring well on city property, city easements, or any other property.

### **6.5 DECONTAMINATION**

This item shall include the per foot cost for all sampling and drilling decontamination equipment and supplies.

### **6.6 DRILL RIG/WITH CREW**

This item shall include all costs associated with use of the drilling rig, drilling crew, and all drilling equipment. This should only include the driller and helper(s). Do not include any professional field staff responsible for collecting and conducting field analyses of drilling samples. This item must be bid on a footage basis. If additional footage is required, reimbursement will be on a per foot basis.

### **6.7 FIELD WORK PLAN**

This item shall include all labor and equipment costs to properly complete and submit the Work Plan Worksheet. The Work Plan Worksheet is included as Attachment E.

### **6.8 FIELD TEST EQUIPMENT**

This item shall include the per day cost to use the listed field analytical equipment such as a photoionization detector, organic vapor analyzer, colorimetric detector tubes, interface probe, etc.

### **6.9 FULL SITE SURVEY**

This item shall include all costs associated the site survey as described in Sec.3.3.6.

### **6.10 GEOPHYSICAL SURVEY**

This item shall include all costs for conducting the geophysical survey. The costs shall include all activity relative to conducting the survey; i.e., mobilization, all necessary equipment, equipment placement, field analysis of the data, removal of equipment, crew member(s) to operate and oversee the survey; and imaging of the data for inclusion in the final report. The equipment used for conducting the survey must use an appropriate technology for identifying and quantifying the location of buried utility lines and underground tanks; i.e., radar or seismic imaging are appropriate methods, whereas, a metal detector is not an appropriate method. All underground utility lines and buried tanks must be documented through geophysical profiles and their locations shall be depicted on a base map of the site (Figure 1) and included in the final remedial report.

### **6.11 GROUNDWATER SURVEY**

This item shall include the per probe cost for conducting the groundwater survey. The per probe cost shall include all activity relative to each probe; i.e., mobilization, necessary equipment, probe installation to groundwater, groundwater extraction, field analysis of the sample, removal of the probe, and crew member(s)

to operate and oversee the survey. The equipment used for analyzing groundwater samples in the survey must detect and quantify concentrations for each specified compound (benzene, toluene, ethylbenzene, and xylene) with detection levels equal to or less than the Kansas Action Levels (KALs). Any contamination detected, even if below KALs, must be documented and included in the final report.

**6.12 HEATED HEADSPACE**

This item shall reflect the per test cost for collecting groundwater samples and analyzing the samples using heated headspace or equivalent methodology incorporated in the groundwater survey. The samples must be analyzed for the same constituents outlined in the Groundwater Survey. The sample detection limits must be utilized.

**6.13 LAB METHODS**

This item shall include designation of the EPA methods to be used for laboratory analysis of air, soil and water samples. (ref. ATTACHMENT C)

**6.14 LABORATORY NAME**

This item shall include the designation of the KDHE approved laboratory that will be performing the analyses of air, water and soil samples.

**6.15 OTHER**

This item shall include all costs not included in other items of the cost proposal sheet. If this category is used, the bidder must list each item and briefly explain its function.

**6.16 OTHER STAFF**

This item shall include the cost for other staff that are necessary to properly complete the tasks required in the categories listed. Provide the title of the individual who will perform the duties. This item shall be bid on an hourly basis.

**6.17 PER DIEM**

This item shall be a fixed price per person to cover lodging and expenses. Per Diem will be approved only for each night an employee is required to remain on site overnight.

**6.18 PERMITS AND EASEMENTS**

This item shall include all labor, mobilization, equipment, supplies, and any other costs necessary to obtain all permits and easements to implement the RDP, and construct and operate the remedial system.

**6.19 PRODUCT SAMPLES**

This item shall include total cost associated with the collection and analysis of the product sample (ie. labor, equipment, shipping, etc.). Provide the per sample cost for analysis of each constituent indicated.

**6.20 PROJECT GEOLOGIST**

This item shall include the cost for the Project Geologist as defined in Section 1.3 of this document. This item shall be bid on an hourly basis.

**6.21 PUBLIC WELL INFLUENCE TEST**

This item shall include all labor, per diem, equipment, materials, and any other costs necessary to conduct a public well influence test. The public well influence test shall be conducted for a period of 24 hours, unless indicated otherwise by the KDHE Project Manager or as indicated on the Project Bid Proposal Sheets. Prior to start of test, the Vendor must notify City water personnel or well owner to shut down well for a period of at least 24 hours. This will allow the aquifer to recover from pumping stress before the test is conducted. Required data will consist of the flow rate of the public well and draw down in no more than four monitoring wells. After initial water levels are measured, water level measurements will be obtained hourly from the monitoring wells unless otherwise indicated by the KDHE Project Manager. Water will be discharged through the existing City system. This item shall be bid on an hourly rate and shall be reimbursed in accordance with the actual number of hours the test was conducted. Reimbursement will not be provided for improperly conducted tests. The purpose of the test is to determine if hydraulic communication exists between the aquifer into which the public water supply is completed and the aquifer impacted by the petroleum hydrocarbon release. Well recovery data will not be considered part of the Public Well Influence Test.

### **6.22 REMEDIAL DESIGN PLAN**

This item shall include all labor and equipment cost to properly complete and submit the Remedial Design Plan. The Remedial Design Plan requirements and format are included in Section 4.6 of this document.

### **6.23 REMEDIAL DESIGN REPORT**

This item shall include all labor and equipment cost to properly complete and submit the Remedial Design Report. The RDR requirements and format are included in Section 4.5 of this document.

### **6.24 RIG MOBILIZATION**

This item shall include all costs for moving drilling equipment, drilling personnel, and drilling supplies to and from the site and at locations throughout the site.

### **6.25 SOIL BORING PLUGGING**

This item shall include the cost for labor, equipment and supplies to plug all soil borings in accordance with KDHE Regulations and Guidelines. This item must be bid on a per foot basis.

### **6.26 SOIL SAMPLES**

This item shall include total cost associated with the collection and analysis of samples taken (ie. labor, equipment, shipping, etc.). All samples shall be analyzed in accordance with the criteria provided in this document for the constituents outlined in the bid sheet. Provide the per sample cost for analysis of each constituent indicated.

### **6.27 SVE TEST**

This item shall include all labor, equipment, materials, and any other costs that are necessary to conduct a soil vapor extraction test. The test will be conducted for a minimum of 8 hours. Reimbursement will not be provided for improperly conducted tests. KDHE reserves the right to alter the number of soil vent tests or the length of time the test will be conducted at the site. This item shall be bid on an hourly rate and shall be reimbursed in accordance with the actual number of hours the test was conducted.

### **6.28 SVE TEST SETUP AND DISMANTLE**

This item shall include all mobilization, labor, equipment, materials, and any other costs that are necessary to set-up and dismantle the SVE test. This shall be bid on a lump sum basis. KDHE reserves the right to alter the number of tests that will be conducted at the site.

### **6.29 SOIL WASTE**

This item shall include all labor, equipment, and supply costs necessary to handle, treat, and dispose of soil waste generated during field activities. Preferred method of handling and treatment of soils: scarification-achieved by spreading hydrocarbon contaminated soils **6" thickness or less** across the site and turning it until the contamination level, based on field screening methods, falls below KDHE standards for soil remediation. Scarification of soils must be located away from receptors such as sewer inlets, open boreholes, etc. **All applied methods must comply with local, state, and federal laws.**

### **6.30 SUPPORT VEHICLE**

This item shall include the cost for all vehicles necessary to transport all staff to conduct the investigation. This item will be bid on a per day basis per vehicle and is inclusive of all incidental costs ie. tolls, maintenance expense, gas etc.

### **6.31 UTILITY SURVEY**

This item shall include all costs necessary for surveying each underground and aboveground utility on-site and on adjacent property(ies) affected by the remedial system installation. This item shall be bid on a lump sum basis.

### **6.32 WATER SAMPLES**

This item shall include total cost associated with the collection and analysis of water samples collected (ie. labor, equipment, shipping, etc.). All samples shall be analyzed in accordance with the criteria provided in this document for the constituents outlined in the bid sheet. Provide the per sample cost for analysis of each

constituent indicated and any other constituents necessary to properly implement and operate the remedial system.

### **6.33 WATER WASTE**

This item shall include all labor, equipment, and supply costs that are necessary to handle, treat (i.e air stripping, carbon, etc.) and dispose of water waste generated during field and hydrologic testing activities. Waste water will not be left on-site. **All applied methods must comply with local, state, and federal laws.**

### **6.34 WELL COMPLETION**

This item shall include the cost for a well pad, flush or stick up protective locking cover, well development, and well tagging for all monitoring wells, observation wells, soil vapor extraction wells, and pump test well(s). All wells must be completed in accordance with regulations and KDHE guidelines. All wells must be developed to the extent that each well can be fully used for its intended purpose. This cost shall be bid on a per well basis.

### **6.35 WELLS**

This item shall include the cost for the blank well casing and screen; annular space gravel pack, annular seal, and grout for all monitoring wells, observation wells, soil vapor extraction wells, and pump test well(s). Do not include well head completion and mobilization in this category. This cost shall be bid on a per foot basis and if additional wells are required, reimbursement will be based on this per foot cost. KDHE will not reimburse for improperly constructed wells, or wells which cannot be used for long term monitoring at the site.

**ATTACHMENT A**  
**KDHE MONITORING WELL DESIGN**

## STANDARD MONITORING WELL DESIGN

### WELL HEAD PROTECTOR

Steel or PVC cover with water tight cap, set in the concrete pad. Should be equipped with a locking device to prevent tampering. Cover should provide adequate space to allow access to the well.

### CONCRETE PAD

Should be a minimum of 2'x2'x4" thick to secure the protective cover, prevent pooling of water and vegetative growth around the well, and allow for placement of a surveyor pin.

### IMPERVIOUS GROUT

The upper 20' of the well must be grouted with impervious grout as required by K.A.R. 28-30-2k and 6b (see next page for quotes)

### SCREEN SEAL

A 2' layer of bentonite chips or pellets should be placed on the gravel pack to prevent infiltration of grout into the gravel pack.

### GRAVEL PACK

The gravel pack should be sized to prevent infiltration of fines into the well. The source of the gravel pack material should be carefully determined to eliminate the possibility of contamination of the well during construction.

### WELL CASING

Well casing shall terminate not less than one foot above ground surface. The following well casings are acceptable for monitoring well use.

2" I.D. PVC schedule 40 or thicker

4" I.D. PVC SDR 26 or thicker

5" I.D. PVC SDR 26 or thicker

Steel casing shall be 10 gauge or thicker

All casing materials must be connected without use of solvents, glues, or materials which would induce contamination into the well.

Some other casings are approved for well construction but are not as commonly used.

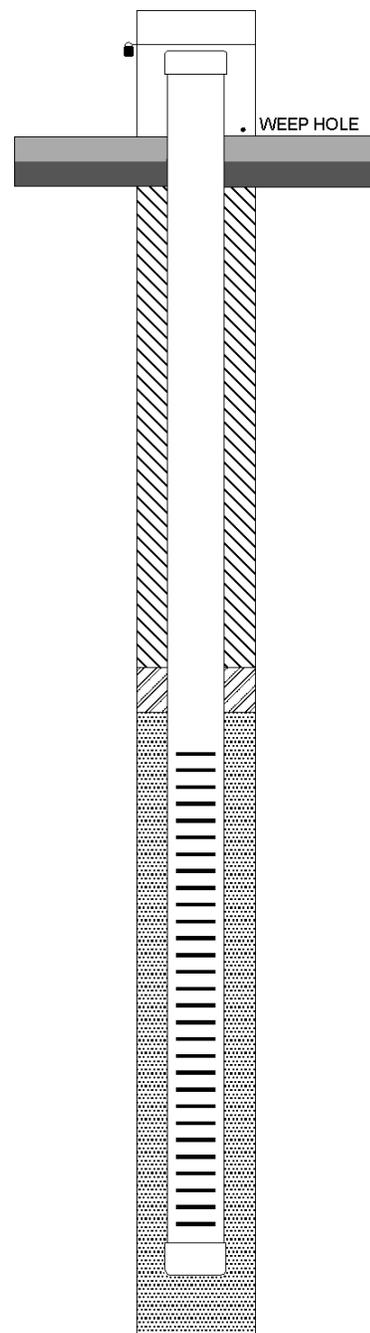
All casing materials must be selected so that incompatibility problems do not occur.

### SCREEN

Wells must be equipped with manufactured well screen which provides adequate communication with the aquifer to provide a representative sample without allowing the sediments to enter the well.

### CONTRACTOR LICENSING

All monitoring wells must be constructed by a licensed water well contractor as specified under K.A.R. 28-30-3. (See next page for quotes)



### **K.A.R. 28-30-2 (k) Grout**

Grout means cement grout, neat cement grout, bentonite clay grout or other material approved by the department used to create a permanent impervious watertight bond between the casing and the undisturbed formation surrounding the casing or between two or more strings of casing.

- (1) "Neat cement grout" means a mixture consisting of one 94 # bag of portland cement to 5-6 gallons of clean water.
- (2) "Cement grout" means a mixture consisting of one 94 # bag of portland cement to an equal volume of sand having a diameter no larger than 0.080 inches (2 millimeters) to 5-6 gallons of clean water.
- (3) "Bentonite clay grout" means a mixture consisting of water and commercial grouting or plugging sodium bentonite clay containing high solids such as that manufactured under the trade name of "volclay grout", or an equivalent as approved by the department.
  - (A) The mixture shall be as per the manufacturer's recommendations to achieve a weight of not less than 9.4 pounds per gallon of mix. Weighing agents may be added as per the manufacturer's recommendations.
  - (B) Sodium bentonite Pellets, tablets or granular sodium bentonite may also be used provided they meet the specifications listed in K.A.R. 28-30-2(k), (3), above.
  - (C) Sodium bentonite products that contain low solids, are designed for drilling purposes or that contain organic polymers shall not be used.

### **K.A.R. 28-30-6 (b) Grouting**

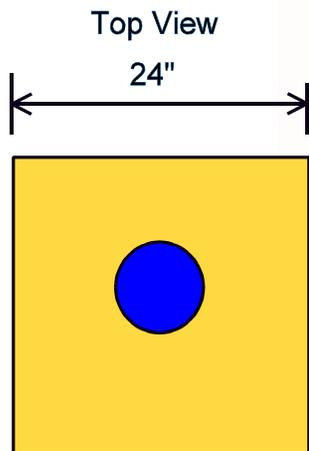
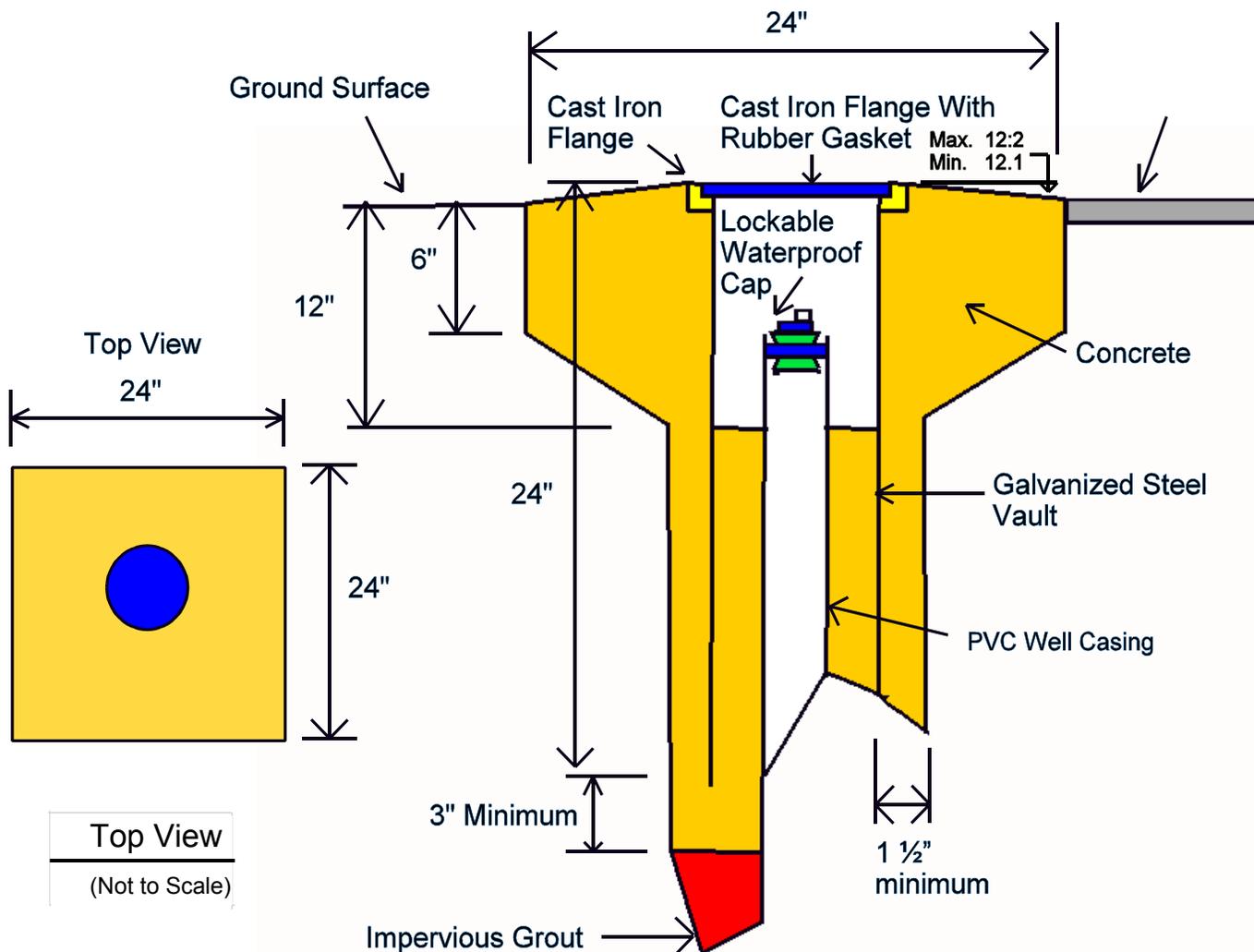
- (1) Constructed or reconstructed wells shall be sealed by grouting the annular space between the casing and the well bore from ground level to a minimum of 20 feet or to a minimum of five feet into the first clay or shale layer, if present, whichever is greater. If a pitless well adapter or unit is being installed, the grouting shall start below the junction of the pitless well adapter or unit where it attaches to the well casing and shall continue a minimum of 20 feet below this junction or to a minimum of five feet into the first clay or shale layer whichever is greater.
- (2) To facilitate grouting, the grouted interval of the well bore shall be drilled to a minimum diameter at least three inches greater than the maximum outside diameter of the well casing. If a pitless well adapter or unit is being installed on the well's casing, the well bore shall be a minimum diameter of at least three inches greater than the junction diameter of the well casing through the grouted interval below the junction of the pitless well adapter or unit where it attaches to the well casing.
  - (c) If groundwater is encountered at a depth less than the minimum grouting requirement, the grouting requirement may be modified to meet local conditions if approved by the department.

### **K.A.R. 28-30-3 Licensing**

- (a) Eligibility. To be eligible for a water well contractor's license an applicant shall:
  - (1) Have passed an examination conducted by the department; or
  - (2) Meet the conditions contained in subsection (c).
- (b) Application fees.
  - (1) Each application shall be accompanied by an application fee of \$ 10.00.
  - (2) Before issuance of a water well contractor's license, each contractor shall pay a license fee of \$ 100.00 plus \$ 25.00 for each drill rig operated by or for the contractor. These fees shall accompany the application and shall be by bank draft, check or money order payable to the Kansas Department of Health and Environment- water well licensure.
- (c) Reciprocity.
  - (1) Upon receipt of an application and payment of the required fees from a nonresident, the secretary may issue a license, providing the nonresident holds a valid license from another state and meets the minimum requirements for licensing as prescribed in K.S.A. 82a-1207, and any amendments thereto.
  - (2) If the nonresident applicant is incorporated, evidence shall be submitted to the Department of Health and Environment showing that the applicant meets the registration requirements of Kansas Secretary of State.
  - (3) Nonresident fees for a license shall be equal to the fee charged a Kansas contractor by the applicant's state of residence but shall not be less than \$ 100.00. The application fee and drill rig license fee shall be the same as the Kansas resident fees.

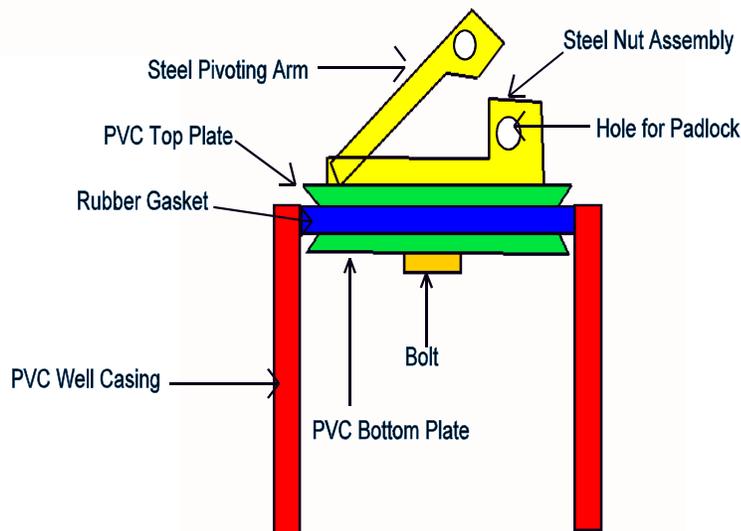
# FLUSH-MOUNT WELL CONSTRUCTION DETAIL

(Not to Scale)



Top View  
(Not to Scale)

Casing	2"	4"
Vault	6"	9"
Concrete Pad	24" x 24"	24" x 24"



**LOCKABLE WATERPROOF CAP**  
(Not to Scale)

**MONITORING WELL DESIGN  
ADDITIONAL INSTRUCTIONS**

**FLUSH-MOUNT WELL HEAD COMPLETION:**

K.A.R. 28-30-6 (e) does not allow well casing to be terminated less than one foot above finished ground surface. Because storage tank site investigations are often conducted in areas where completing monitoring well heads above grade is not practical, consideration must be given to completing flush-mount monitoring well heads.

If monitoring well must be completed with a flush-mount well head design, a waiver of K.A.R. 28-30-6 (e) must be requested in writing. The procedures for requesting a waiver of this regulation are described as follows:

- 1) Prior to the monitoring well installation, the written request must be submitted to the address indicated below.
- 2) The request must contain the following information:
  - a. facility name and street address
  - b. legal description of the property where the wells are proposed to be located.
  - c. number of wells to be installed with flush-mount well heads
  - d. reason(s) why the regulation should be waived
  - e. approximate depth to groundwater in the local area
  - f. the general geology or lithologies expected to be encountered in drilling
  - g. specifications and/or diagrams of the vault proposed to be installed including the manufacturer's name and any other descriptive information such as a manufacturer's trade sheet.
- 3) Wait for approval of the waiver request before completing monitoring wells.
- 4) When waivers are approved and monitoring wells are installed with a flush-mount wellhead design, the well head completion must be indicated accordingly in the lithologic section of the WWC-5 water well record form. The name of the KDHE contact person that approved the waiver must also be provided in the lithologic section of the WWC-5 form.

Any waiver of regulations applies only to the wells and information indicated in the written request. A verbal request for waiver of regulations may be approved on any additional wells needed for the same area or site. The verbal request must be directed to the phone number below.

**MONITORING WELL GROUTING REQUIREMENTS:**

K.A.R. 28-30-6, part (b) requires that constructed or reconstructed wells be sealed by grouting the annular space between the casing and the well bore from ground level to a minimum of 20 feet or to a minimum of five feet into the first clay layer, whichever is greater. Part (c) of the same regulation specifies if groundwater is encountered at a depth less than the minimum grouting requirement, the grouting requirement may be modified to meet local conditions if approved by the department.

If modifications to the grouping requirements are necessary solely because of shallow groundwater, a waiver or the regulations is not needed.; however, the reason for modifying the grouping requirements must be indicated accordingly on the WWC-5 water well record form. In situations where grouping modifications are required for reasons other than shallow groundwater, a waiver of K.A.R. 28-30-6(b) must be obtained following the same procedures as described for flush-mount well heads above.

Submit requests for waivers and direct any questions on well design regulations to:  
Kansas Department of Health & Environment  
Bureau of Water, Geology Section  
1000 SW Jackson, Suite 420  
Topeka, Kansas 66612-1367  
Phone: (785)296-5522

**ATTACHMENT B**  
**SOIL BORING PLUGGING CRITERIA**  
**K.A.R. 28-30-7(d)**

**ARTICLE 30 - WATER WELL CONTRACTORS LICENSE;  
WATER WELL CONSTRUCTION AND ABANDONMENT**

This article regulates the construction, reconstruction, treatment and plugging of water wells and sets forth procedures for the licensing of water well contractors as required by K.A.S. 82a-1201 to 82a-1215 and amendments thereto.

28-30-7 Plugging of abandoned wells, cased and uncased test holes.

- (d) Plugging of abandoned holes. If the hole penetrates an aquifer containing water with more than 1,000 mg/l, total dissolved solids or is in an area determined by the department to be contaminated, the entire hole shall be plugged with an approved grouting material from the bottom of the hole, up to within three feet of the ground surface using a grout tremie pipe or similar method. From three feet below ground surface to ground surface the plugged hole shall be covered over with compacted surface silts or clays; otherwise, the hole shall be plugged in accordance with the following paragraphs.
- (1) Plugging of abandoned cased test holes. The casing shall be removed if possible and the abandoned test hole shall be plugged with an approved grouting material from the bottom of the hole, up to within three feet of the ground surface, using a grout tremie pipe or similar method. From three feet below ground surface to ground surface the hole shall be covered over with compacted surface silts or clays. If the casing cannot be removed, in addition to plugging the hole with an approved grouting material the annular space shall also be grouted as described in K.A.R. 28-30-6 or as approved by the department.
  - (2) Abandoned uncased test holes, exploratory holes or any bore holes except seismic or oil field related exploratory and services holes regulated by the Kansas Corporation Commission under K.A.R. 82-3-115 through 82-3-117. A test hole or bore hole drilled, bored, cored, or augered shall be considered an abandoned hole immediately after the completion of all testing, sampling or other operations for which the hole was originally intended. The agency or contractor in charge of the exploratory or other operations for which the hole was originally intended is responsible for plugging the abandoned hole using the following applicable method, within three calendar days after the termination of testing or other operations.
    - (A) The entire hole shall be plugged with an approved grouting material from bottom of the hole, up to within three feet of the ground surface, using a grout tremie pipe or similar method.
    - (B) From three feet below ground surface to ground surface the plugged hole shall be covered over with compacted surface silts or clays.
    - (C) For bore holes of 25 feet or less, drill cuttings from the original hole may be used to plug the hole in lieu of grouting material, provided that an aquifer is not penetrated or the bore hole is not drilled in an area determined by the department to be a contaminated area.

**ATTACHMENT C**  
**LABORATORY METHODS**

## APPROVED ANALYTICAL METHODS FOR ORGANIC COMPOUNDS

ANALYTE	SOLID AND HAZARDOUS WASTE METHODS		WATER METHODS	
	No.	PARAMETER	No.	PARAMETER
<b>Benzene</b>	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524.2	Purgeable Organic Compounds
			602	Purgeable Aromatics
			624	Purgeables
			1624	Volatile Organic Compounds
<b>BTEX</b>	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524	Purgeable Organic Compounds
<b>1,2-DCA</b>	8010*	Halogenated Volatile Organics	502.1	Volatile Halogenated Organic Compounds
	8021*	Halogenated and Aromatic Volatiles	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524.2	Purgeable Organic Compounds
			601	Halogenated Volatile Organics
		624	Purgeables	
		1624	Volatile Organic Compounds	
<b>Ethylbenzene</b>	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524.2	Purgeable Organic Compounds
		602	Purgeable Aromatics	
		624	Purgeables	
		1624	Volatile Organic Compounds	
<b>MtBE</b>	8020*	Aromatic Volatile Organics	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240*	Halogenated and Aromatic Volatiles		
	8260	Volatiles		
<b>Naphthalene</b>	8021*	Halogenated and Aromatic Volatiles	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8100	Polynuclear Aromatic Hydrocarbons	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8250	Semivolatile Organic Compounds	524.2	Purgeable Organic Compounds
	8270	Semivolatile Organic Compounds	550	Polycyclic Aromatic Hydrocarbons
	8310	Polynuclear Aromatic Hydrocarbons	550.1	Polycyclic Aromatic Hydrocarbons
	8260	Volatiles	610	Polynuclear Aromatic Hydrocarbons
			625	Base/Neutrals & Acids
		1625	Semivolatile Organic Compounds	
<b>Toluene</b>	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524.2	Purgeable Organic Compounds
		602	Purgeable Aromatics	
		624	Purgeables	
		1624	Volatile Organic Compounds	

\* Water samples must be prepared using method 5030 (purge & trap extraction) if this test method is used.

## APPROVED ANALYTICAL METHODS FOR ORGANIC COMPOUNDS

ANALYTE	SOLID AND HAZARDOUS WASTE METHODS		WATER METHODS	
	No.	PARAMETER	No.	PARAMETER
<b>Xylene</b>	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524.2	Purgeable Organic Compounds
<b>EDB</b>	8260	Volatiles	504	DW by Microextraction
			504.1	123TCP by Microextractin & GC
<b>Polynuclear Aromatic Hydrocarbons</b>	8310	Polynuclear Aromatic Hydrocarbons	610	Polynuclear Aromatic Hydrocarbons (High performance Liquid Chromatography)
<b>Lead</b>			239.2	Atomic Absorption Spectrometry (Graphite Furnace)
			200.8	Inductively Coupled Plasma Mass Spectrometry
			200.9	Atomic Absorption Spectrometry-Stabalized Temperature (Graphite Furnace) Method
<b>Air Sample Analysis:</b>				
40 CFR Ch. 1 (7-1-91 Edition) Part 60, Appendix A, Method 18 (Flexible Bag Procedure)				

**ATTACHMENT D**  
**KDHE WELL TAGGING PROCEDURES**

## ADDITIONAL INSTRUCTIONS FOR THE SITE IDENTIFICATION FORM

A State of Kansas Site I.D. record must be developed for all wells installed or/and monitored at Leaking Underground/Aboveground Storage Tank sites (including existing private or public wells). The Site I.D. record is used to uniquely identify individual sampling points at LUST/LAST (and other) projects for use in the State of Kansas' computerized data systems. To establish a Site I.D. record, a Site I.D. form must be completed and the identically numbered tag must be permanently affixed to the well, then the form is returned to KDHE. Specific instructions (and exceptions) for completing the Site I.D. form and affixing the tag are described below.

### Part 1: State of Kansas Site I.D. Form

The instructions for completing the Site I.D. form are provided in detail on the reverse side of the form itself. Please note the following additional information:

- A) Each Site I.D. form is uniquely numbered and has an identically numbered Site I.D. tag attached to it. For this reason, DO NOT INTERCHANGE TAGS AND FORMS.
- B) A separate Site I.D. form must be completed for each monitoring well installed and each private or public well sampled. If an existing well has already been tagged (and the tag is readable), do not tag the well again. Also see the "Caution" statement in the tag installation notes on affixing tags to existing wells.
- C) No two Site I.D. numbers are the same. EACH MONITORING WELL INSTALLED MUST HAVE A UNIQUE SITE I.D. TAG ATTACHED, additionally, GROUPS OF WELLS MAY BE ASSIGNED THE SAME PROJECT CODE.
- D) Please write the Site I.D. number in the upper margin near the right edge of the Water Well Record form (form WWC-5) for each monitoring well installed at a LUST/LAST site.

Specific directions for topics not addressed by the instructions on the Site I.D. form are listed below (refer to the attached example Site I.D. form completed for the third monitoring well installed at a hypothetical LUST site).

- Item c: The person/company/entity responsible for plugging the well being tagged, should be placed in this field (if no responsible party is designated, this will often be the State of Kansas, but not always). It is possible that the property/facility owner name of each well tagged at a given project site could be the same, or it could be different for all (or only some) of the wells.
- Item i: This item should be completed after conducting a legal survey as specified in the original scope of work. All location information for each monitoring well should be obtained from the survey data (e.g. legal description, distance from the southeast corner of the section, etc).
- Item k: After entering the name of the individual who conducted the survey, enter "NA" "NA" in item kk. In item "y" (Comments), put the name of the company the registered land surveyor works for (see attached example Site I.D. form).
- Item p: Enter the name of the individual who completed the Site I.D. form in item (p), enter "NA" "NA" in item (pp). In item "y" (Comments), put the name of the company the person in item (p) is working for (see attached example Site I.D. form).
- Item r: The program code for Trust Fund sites is "ET", for LUST sites, it is "EL". The letters must be circled as shown on the example Site I.D. form. That information will be provided in the scope of work for the site.
- Item s: Enter the KDHE project code assigned to the site (that information will be provided in the scope of work for the site).

The remainder of the Site I.D. form must be accurately completed by the contractor's project manager, geologist, or engineer primarily responsible for managing the site investigation. The form must be completed according to the instructions herein, and those on the back of the Site I.D. form, and as demonstrated on the attached example Site I.D. form. Failure to submit the forms or submitting inaccurate data could restrict or delay reimbursement for work completed. The forms must be completed and submitted to the address below within two weeks after tagging the well. Copies of the Site I.D. forms must be included in the appropriate appendix of the final report. Any unused Site I.D. forms must be returned to the address below.

Kansas Department of Health & Environment  
Office of Information Systems  
Systems Management Section (GIS Center)  
1000 SW Jackson, Suite 010  
Topeka, Kansas 66612-1311

## Part II: Affixing the Tag to a Well

The uniquely numbered tag to be permanently affixed to a well will be found attached to the corresponding Site I.D. form. **DO NOT INTERCHANGE TAGS AND FORMS.**

The tag is made of aluminum and measures approximately 2.5 X 0.75 X 0.02 inches. It can be easily molded to the shape of the surface to which it will be affixed. The method of installing the tag will depend on how a well head was completed. Note the tags are provided, however, installation hardware must be supplied by the contractor. Acceptable methods of tag installation are discussed as follows:

- 1) Above-grade well head completion: For monitoring wells that have casing terminating above grade with exterior steel or PVC well head protector (standard monitoring well design), the Site I.D. tag is to be installed on the exterior of the protective cover approximately 3.0 inches below the hasp used in locking the protective cover cap. The tag must be secured to the protective cover by means of two one-way metal screws or pop-rivets. Do not use adhesives to affix the tag to the protective cover.
- 2) Flush-mounted monitoring well heads: Since flush-mount manholes vary in design, there is not an entirely standard method for affixing the well tag, but, the tag must be installed inside the manhole in an area and manner leaving the tag readily visible and accessible. The tag may be affixed to the inside of the manhole cover or anchored by some means to the concrete inside the manhole. Do not use adhesives to affix the tag.
- 3) Private or public wells: The method for affixing a tag to a private or public water well must be determined according to the specific well head design, which will vary. Keep in mind the tag must remain visible and accessible after it is permanently affixed to the well. Common methods of affixing tags to these types of wells are anchoring the tag to the concrete pad at the base of the well, attaching the tag to the well house, or wiring the tag to the well casing. Remember to obtain permission prior to sampling or tagging private or public wells.

### Notes on tag installation:

**CAUTION!** State regulations prohibit perforation of a well casing. See K.A.R. 28-30-6(e) as stated below.

**K.A.R. 28-30-6(e)** provides in part: "...No opening shall be made through the well casing except for the installation of a pitless adapter so designed and fabricated to prevent soil, subsurface and surface water from entering the well."

- A. Remember, the tag must be visible and must remain permanently affixed to the well sampled as part of the investigation. Copies of photographs depicting acceptable methods of tag installation have been attached.
- B. When affixing a tag to any well that does not have a protective casing installed, state regulations will not allow any holes to be drilled into an existing well casing. An alternative method for affixing the tag must be used.
- C. Prior to sampling or tagging any private or public water supply well, specific permission must be obtained from the appropriate authority.
- D. If there are any questions on installing the tag or completing the Site I.D. form, contact KDHE at (785)296-6282.



a. County:

b. Site I.D. number:

c. Owner Name:

d. Owner Address:

City

State

Zip Code

e. This site is located at (66 Characters max.)

f. Encoded Owner Name:

g. Well (site) Number

h. Encoding Scheme (Circle only one number):

1. If **city owned**, enter the first eleven letters of the city name (leave a blank space between words if more than one word is used).
2. If **County owned**, enter the first eleven letters of the county name ("Pottawatom", for Pottawatomie) or abbreviate when it is necessary to show the type of site ("AL San Lndf", for Allen County Sanitary Landfill).
3. If **business owned**, print the first eleven letters of the business name (include RWDs, e.g., SN RWD1, for Shawnee Co. RWD 1).
4. If **owned by an individual**, print the first eight letters of the last name, a comma, and the first two letters of the first name.
5. If **none of the above apply**, encode the owner name in the most meaningful manner possible, and explain the procedure in item y.

i. This well (site) is in Sec. \_\_\_\_ , Twn. \_\_\_\_ , Rng. \_\_\_\_ (circle one) E / W. From the (circle one) NE / SW / SE / NW corner of this section, this site is \_\_\_\_ ft (circle one) N / S and \_\_\_\_ ft (circle one) E / W , and is in the \_\_\_\_ 1/4 of the \_\_\_\_ 1/4 of the \_\_\_\_ 1/4 of the \_\_\_\_ 1/4.

J. Measurement Method Used (circle only one number):

1. Legal Survey
2. Absolute Survey
3. GPS Survey
4. Technical Survey
5. Compass & Chain
6. Hand Wheel
7. USGS 7.5 Topomap
8. County Road Map
9. Other: \_\_\_\_\_

k. Measured By; \_\_\_\_\_  
(Bureau)

last name

first init.

abbreviate

abbreviate

, \_\_\_\_ of (kk.) \_\_\_\_\_ (Agency) \_\_\_\_\_

l. The tag is attached to the \_\_\_\_\_

, (ll.) using \_\_\_\_\_

m. Water Source (Circle only one number):

1. Well
2. Spring
3. Pit
4. Lake / Pond
5. Stream / River
6. Ditch / Canal
7. Storm Runoff
8. Treated Water (Distribution System)
9. Waste Water

n. Use(s) of Water (Circle all that apply):

1. Domestic
2. Irrigation
3. Feedlot
4. Industrial
5. Public Water Supply
6. Oilfield Water Supply
7. Lawn and Garden Only
8. Air Conditioning
9. Dewatering
10. Monitoring Well Only
11. Injection Well
12. Artificial Recharge
13. Recreation
14. Other (Specify): \_\_\_\_\_

o. Type of Casing (Circle only one number):

1. Steel
2. PVC
3. RMP (SR)
4. ABS
5. Wrought Iron
6. Asbestos Cement
7. Fiberglass
8. Concrete Tile
9. Other (Specify, or print "UNK" if unknown): \_\_\_\_\_

p. Form Completed By: \_\_\_\_\_  
(Bureau)

last name

first init.

abbreviate

abbreviate

, \_\_\_\_ of (pp.) \_\_\_\_\_ (Agency) \_\_\_\_\_

q. Your Work Phone Number: (\_\_\_\_\_) - \_\_\_\_\_ - \_\_\_\_\_  
Area Code Prefix Numberqq. Date: \_\_\_\_ - \_\_\_\_ - \_\_\_\_  
MM DD YYYY

r. Program Code:

EP	ER	EE	EU	EL	ET	EJ	SC	SG	SN	SW	SE	SP	FK	LM	ES	AR	KC
PU	PC	PT	PE	PD	PV	PI	WI	WE	PP	HL	HD	HF	HS	WC	RP	GS	US

s. Project Code:

t. Optional "Well Number Codes": Consultant Code \_\_ , and / or (S)hallow, (I)ntermediate, or (D)eep \_\_\_\_ .

u. Well Depth (TOC to TD): \_\_\_\_ . \_\_\_\_ ft. v. TOC is \_\_\_\_ . \_\_\_\_ ft above / below ground elevation. w. TOC Elevation \_\_\_\_

x. DWR File Number: \_\_\_\_\_

xx. Is this a replacement well? (circle one) YES / NO

y. Comments: \_\_\_\_\_

AFTER YOU HAVE COMPLETED THIS FORM, PHOTO-COPY IT AND KEEP THE COPY FOR YOUR FILES. SEND THE ORIGINAL TO THE KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT, OFFICE of INFORMATION SYSTEMS, SYSTEMS MANAGEMENT SECTION at Forbes Field (Bldg 740), Topeka, Ks. 66620.

Complete this form legibly using a soft lead pencil. PLEASE DO NOT USE INK (a typewriter may be used).NOTE : ALL OF THIS FORM SHOULD BE COMPLETED IF THE INFORMATION CAN BE REASONABLY ACQUIRED.

Check the amended report box only when amending an existing report.

- a. Write the full name of the county this site is in, do not abbreviate or use numbers.
- b. Copy the Site I.D. number from the tag when the Amended Report box is marked (first time applications will always have the Site I.D. number pre-printed on the form).
- c. Write the name of the entity that owns this site (example: City of Attica). If this site (a river for example) doesn't have an owner, then use the entity name (example: Walnut River). 32 characters maximum may be used.
- d. Write the owner address.
- e. Write the street address where this well (site) is located. If the street address is unknown (or if the well/site is in a rural area), write the name of the nearest marked intersection and it's distance and direction from the well, then write the name of the nearest town. Do not write more than 60 characters.
- f. Code the owner name using one of the five encoding schemes listed in Item h.
- g. Write a three digit numerical well (site) number (use leading zeros when necessary). Do not use alpha characters (letters).
- h. Circle the number that represents the coding scheme used in Item f.
- i. Write the section, township, range, and circle either "E", or "W". Circle the section corner that measurements were made from, then write the number of feet (and circle the appropriate direction) for both required footage measurements. Write the 1/4 section descriptions(they can be calculated after measuring the section perimeter on a Topo Map). NOTE : COMPLETE THIS ITEM EVEN IF A GPS SURVEY IS PERFORMED.
- j. Circle the number that represents the method most accurately describing how you calculated the footages given above.
  1. Legal Survey = a survey performed and certified by a licensed surveyor.
  2. Absolute Survey = the same as a legal survey except that an unlicensed person performed the survey.
  3. GPS Survey = a survey made using satellite receivers to calculate latitude and longitude which will be added to this record later.
  4. Technical Survey = measurements made using the same instruments that a legal survey would use, but utilizing perceived section lines instead of actually locating the section corner pin.
  5. Compass and Chain = measurements made using these tools and perceived section lines.
  6. Hand Wheel = see compass and chain.
  7. USGS 7.5' Topo Map = Plot site on a 7.5' quadrangle map, measure the map scale, and convert to footage.
  8. County Road Map = Plot site on a county road map, measure the map scale, and convert to footage.
  9. Other = specify and explain any other method used (use comment section if more space is needed).
- kk. Write the last name, then the first initial, of the person who performed the survey.
- kk. Write the agency name (abbreviated to 2 letters), then the bureau name (abbreviated to 4 or fewer letters), for the employer of the person indicated in Item k. NOTE : IF THIS SURVEY WAS PERFORMED BY A LICENSED WELL DRILLER OR HIS EMPLOYEE, LEAVE THE BUREAU NAME BLANK AND PUT THE WELL DRILLER'S LICENSE NUMBER IN THE AGENCY NAME FIELD.
- l. Briefly describe where the tag is located, and (l.) the fasteners used to attach it there.
- m. Circle the number (only one number) that represents the best description of the source of this water.
- n. Circle the number(s) that represent(s) the best general description(s) of the use of the water from this site.
- o. Circle the number (only one number) that represents the best description of the type of casing that is in this well (if "Well" is the source). If the casing type is unknown, circle option number 9 and write "UNK" on the blank line.
- p. Write the last name, then the first initial of the person who completed the blanks on this form.
- pp. Follow the instructions given for Item kk.
- q. Write the work phone number for the person who completed this form.
- qq. Write the date the well (site) was tagged (use numbers, e.g. 06-09-91).
- r. Circle the code that represents the program for whom you are visiting this well (site). NOTE : Contact your database administrator if a needed code is not on this list, DO NOT INVENT DIFFERENT CODES. The program codes are as follows :

Environmental Remediation (BER)  
Science & Support (OSS)  
Bureau of Water (BOW)  
Waste Management (BWM)  
EP=Pre-Remedial Projects  
SC=Stream Monitoring Network  
PU=Public Water Supply (PWS)  
HL=Sanitary Landfills  
ER=Remediation Sites  
SG=Groundwater Network  
PC=Chlorinated PWS  
HD=Hazardous Waste Sites EE=Environment  
Emergency (spills)  
SN=Nonpoint Pollution

PT=PWS Test Sources  
HF=Furley / Nies Project  
EU="UST" Sites  
SW=Wasteload Allocation  
PE=PWS Point of Entry  
HS=Special Projects  
EL="LUST" Sites  
SE=Effluent Monitoring  
PD=PWS Distribution Systems  
ET=Trust Fund Sites  
SP=Special Projects  
PV=Private Water Supply Source  
Air and Radiation (BAR)  
EJ=Joint or Special Projects

FK=Pollution (fish kill, spill, etc.)  
PI=Underground Brine Injection  
WC=Wolf Creek Project  
LM=Lake Monitoring Network  
WI=Waste Influent  
RP=Special Projects  
ES=Sanitarian Program  
WE=Waste Effluent  
Other Agencies Programs  
PP=Pre-Treatment Program  
  
AR=DWR Appropriation Rights  
KC=Ks. Corporation Commission  
GS=Ks. Geological Survey  
US=U.S. Geological Survey

- s. Write the existing program specific project code (eg. an alias) for this well (site) if known. If an alias has not been assigned to this site, and one should be developed, write the proposed alias. Information about "How to build the alias" should be centrally coordinated, so consult your section representative for more information on "what to enter", BEFORE MAKING AN ENTRY. These codes are for program staff use only and should not be used outside of the program area for which they are designed.
- t. THIS FIELD IS OPTIONAL. Use it to provide the well number with supplemental significance. Example : Monitoring well number 001 can be coded (using this field) to show: it was installed by consultant "X" (write x in the first blank), and, it is a deep well (write D in the last blank). The computer system will show that this is monitoring well number X001D.
- u. THIS FIELD IS OPTIONAL. Write the well depth (can be reported to one 1/100 of a foot).
- v. THIS FIELD IS OPTIONAL. Write the number of feet (can be reported to one 1/100 of a foot) that the casing extends above or below (circle one) ground level.
- w. THIS FIELD IS OPTIONAL. Write the elevation to the top of the casing (can be reported to one 1/100 of a foot).
- x. Write the Board of Agriculture, Division Of Water Resources, Application number, or, enter "UNK" if unknown, or "NONE" if you know that a DWR appropriation number does not exist.
- xx. Circle either yes, or no, to indicate if this is a replacement well.
- y. Give a general description of this site and its location. Describe any unique aspects of this site (such as the structure of the well house). Site descriptive statements that might enable another person to more easily locate or recognize this site, should be included in this field.

DO NOT INCLUDE SAMPLE ANALYSIS INFORMATION IN THIS FIELD! The laboratories and other departments in KDHE do not receive a copy of this form.

**ATTACHMENT E**  
**FIELD WORK PLAN WORKSHEET**

PETROLEUM STORAGE TANK RELEASE TRUST FUND
REMEDIAL DESIGN FIELD WORKPLAN WORKSHEET

Site Name: \_\_\_\_\_ KDHE Project Code: \_\_\_\_\_

Consulting Firm: \_\_\_\_\_ Consultant Contact: \_\_\_\_\_

Instructions: This form must be completed by providing the information requested below; complete only the sections applicable to actual work that will be conducted. Do not include any attachments with this worksheet other than those described herein.

I. Site Information

1) Site Address: \_\_\_\_\_ (Street) \_\_\_\_\_ (City) \_\_\_\_\_ (County)

2) Legal Description: \_\_\_ 1/4 \_\_\_ 1/4 \_\_\_ 1/4 \_\_\_ 1/4 Section \_\_\_\_, Township \_\_\_\_, South, Range \_\_\_\_ E / W (Circle One)

II. Drilling and Additional Investigative Work

If additional investigative work will not be conducted, items No.2 through No. 5 must still be completed to reflect drilling procedures for saturated or unsaturated zone testing wells, laboratory analytical methods for soil samples that will be collected while drilling, and the pre-pump test round of groundwater sample collection and analysis.

1) If additional investigative work will be conducted, check the methodologies to be used:
\_\_\_ Monitoring Wells \_\_\_ Soil Borings \_\_\_ Other/(List) \_\_\_\_\_

2) List the requested information where indicated:

A) Drilling: If only one type of drilling method is to be used, complete only column "A", if more than one type of drilling method is proposed, complete both columns "A" and "B".

Table with 2 columns: A and B. Rows include: Drill Rig (Brand/Model, Torque Rating), Drill String (Type (Augers, Etc.), O.D./I.D.), Borehole Size, Sample Collection Equipment, Drilling Sample Frequency.

B) Field Screening:

Field Screening Intervals \_\_\_\_\_
Device (Brand / Type / Spec) \_\_\_\_\_
Calibration Sample Frequency \_\_\_\_\_

C) Well Development:

Method (Bailer, pump, etc.) \_\_\_\_\_
Minimum well volume to be withdrawn (Drilling Scenario "A") \_\_\_\_\_
Minimum well volume to be withdrawn (Drilling Scenario "B") \_\_\_\_\_

D) Boring Plugging:

Materials to be used \_\_\_\_\_
Procedure \_\_\_\_\_

3) Laboratory Analytical.

Soil Samples: Collection Equipment \_\_\_\_\_
Analytical Methods \_\_\_\_\_
Water Samples: Collection Equipment \_\_\_\_\_
Analytical Methods \_\_\_\_\_
Air Samples: Collection Equipment \_\_\_\_\_
Analytical Methods \_\_\_\_\_

**4) Waste Handling Procedures:** Briefly describe how soil and water waste generated during drilling, development and sampling activities will be handled, treated, and disposed:

Soil: \_\_\_\_\_  
 Water: \_\_\_\_\_

**5) Decontamination:** Briefly describe decontamination equipment, methods, and procedures to be employed:

\_\_\_\_\_

**III. Saturated and Unsaturated Zone Testing**

**1) Aquifer Testing (Pump Test):** Provide the requested information as indicated.

**A) Pumping Wells (PW):** (Check appropriate blank)

\_\_\_\_\_ Pumping Well to be installed  
 \_\_\_\_\_ Existing Well to be used (Identify existing well to be pumped: \_\_\_\_\_ )

**Observation Wells (OBW):**(Check appropriate blank)

\_\_\_\_\_ All observation wells will be installed  
 \_\_\_\_\_ Only existing wells will be used (Identify existing wells to be used: \_\_\_\_\_ )  
 \_\_\_\_\_ Observation wells will be installed and used in conjunction with existing wells  
 (Identify existing wells to be used: \_\_\_\_\_ )

Provide the following information for each PW and OBW: (include information for each existing well to be used)

Well (Label & denote PW vs. OBW)	_____	_____	_____	_____
Distance (OBW to PW)	_____	_____	_____	_____
Total Well Depth	_____	_____	_____	_____
Casing/Screen Size and Material	_____	_____	_____	_____
Screen Slot size	_____	_____	_____	_____
Screened Interval (depths)	_____	_____	_____	_____
Grout Material	_____	_____	_____	_____
Filter Pack Material and Size	_____	_____	_____	_____
Drilling Scenario (A or B)	_____	_____	_____	_____

**B) Test Equipment:**

Withdraw Pump  
 Brand/Model \_\_\_\_\_  
 Specifications \_\_\_\_\_  
 Max. Discharge Rate \_\_\_\_\_  
 Water Level Measuring Device (PW and OBW)  
 Brand/Model \_\_\_\_\_  
 Specifications \_\_\_\_\_  
 Product Thickness Measuring Device (PW and OBW)  
 Brand/Model \_\_\_\_\_  
 Specifications \_\_\_\_\_

**C) Test Parameters:**

Duration of Test \_\_\_\_\_ Proposed Pumping Rate \_\_\_\_\_  
 Water/Product Level Measurement Frequency \_\_\_\_\_

**D) Discharge Disposal:** Indicate the expected quantity of discharge water from the pump test and briefly describe how it will be handled, treated, and disposed. \_\_\_\_\_

**E) Pump Test/Laboratory Analysis of Discharge Water:**

Number of Samples \_\_\_\_\_  
 Collection Frequency \_\_\_\_\_  
 Collection Location \_\_\_\_\_  
 Analytical Methods \_\_\_\_\_  
 Laboratory to Conduct Analysis \_\_\_\_\_  
 Collection Methods \_\_\_\_\_

**2) Soil Vapor Extraction (SVE)** Provide the requested information as indicated.

**A) SVE Wells:** Number of extraction wells (VEW): \_\_\_\_\_  
 Number of observation wells (VOBW): \_\_\_\_\_

Provide the following information for each VEW and VOBW: (include information for existing wells to be used)

Well (Label and demote VEW vs. VOBW)	_____	_____	_____	_____
Distance (VOBW to VEW)	_____	_____	_____	_____
Total Well Depth	_____	_____	_____	_____
Casing/Screen Size and Material	_____	_____	_____	_____
Screen Slot Size	_____	_____	_____	_____
Screened Interval (depth)	_____	_____	_____	_____
Grout Material	_____	_____	_____	_____
Filter Pack Material and Size	_____	_____	_____	_____
Drilling Scenario (A or B)	_____	_____	_____	_____

**B) Testing Equipment:**

Extraction (e.g. blower):  
 Brand/Model \_\_\_\_\_  
 Specifications \_\_\_\_\_  
 Flow rate (for VEW):  
 Brand/Model \_\_\_\_\_  
 Specifications \_\_\_\_\_  
 Volume Monitoring (for VEW and VOBW):  
 Brand/Model \_\_\_\_\_  
 Specifications \_\_\_\_\_

**C) Test Parameters:**

Duration of Test \_\_\_\_\_  
 Proposed Test Vacuum (inches H<sub>2</sub>O) \_\_\_\_\_  
 Vacuum Measurement Frequency \_\_\_\_\_  
(VEW's and VOBW's)  
 Flow rate Measurement Frequency \_\_\_\_\_  
 and Location (VEW) \_\_\_\_\_

**D) Test Analytical:**

Field Analysis:

Sampling Frequency \_\_\_\_\_  
 Device (Brand/Type/Specifications) \_\_\_\_\_  
 Calibration Standard & Frequency \_\_\_\_\_

Laboratory Analysis:

Number of Samples \_\_\_\_\_  
 Collection Frequency \_\_\_\_\_  
 Collection Location \_\_\_\_\_  
 Analytical Methods \_\_\_\_\_  
 Laboratory to Conduct Analysis \_\_\_\_\_  
 Collection Methods \_\_\_\_\_  
 \_\_\_\_\_

**3) Biovent System Test (BVS):** Provide the requested information as indicated.

**A) Background Well (BW):**(check appropriate blank)

\_\_\_ Background Well to be installed  
 \_\_\_ Existing Well to be used (identify existing well to be used: \_\_\_\_\_)

**Observation Wells (OW):**(check appropriate blank)

\_\_\_ All observation wells will be installed  
 \_\_\_ Only SVE wells will be used (Identify wells to be used: \_\_\_\_\_)  
 \_\_\_ Observation wells be installed and used in conjunction with SVE wells  
 (Identify wells to be used: \_\_\_\_\_)

Provide the following information for each BW and OW: (include information for existing wells to be used)

Well (Label and denote BW vs. OW)	_____	_____	_____	_____
Distance (OW to BW)	_____	_____	_____	_____
Total Well Depth	_____	_____	_____	_____
Casing/Screen Size & Material	_____	_____	_____	_____
Screen Slot Size	_____	_____	_____	_____
Screened Interval (Depths)	_____	_____	_____	_____
Grout Material	_____	_____	_____	_____
Filter Pack Material and Size	_____	_____	_____	_____
Drilling Scenario (A or B)	_____	_____	_____	_____

**B) Testing Equipment:**

Injection (e.g., blower):  
 Brand/Model \_\_\_\_\_  
 Specifications \_\_\_\_\_

**C) Test Parameters:**

Duration of Test \_\_\_\_\_  
 Proposed Air Injection Rate (cfm) \_\_\_\_\_

**D) Test Analytical:**

Field Analysis:

Sampling Frequency \_\_\_\_\_  
 Sampling Method \_\_\_\_\_  
 Device (Brand/Type/Specifications) \_\_\_\_\_  
 Calibration Standard & Frequency \_\_\_\_\_

**4) Air Sparge Test (ASP)** Provide the requested information as indicated.

**A) Injection Well (IW):**(check appropriate blank)

\_\_\_\_\_ Injection Well to be installed  
 \_\_\_\_\_ Existing Well to be uses(Identify existing well to be used: \_\_\_\_\_)

**Observation Wells (OW):**(check appropriate blank)

\_\_\_\_\_ All observation wells will be installed  
 \_\_\_\_\_ Only existing wells will be used (Identify wells to be used: \_\_\_\_\_)  
 \_\_\_\_\_ Observation wells will be installed and used in conjunction with existing wells  
 (Identify wells to be used: \_\_\_\_\_)

Provide the following information for each IW and OW: (include information for existing wells to be used)

Well (Label and denote IWvs. OW)	_____	_____	_____	_____
Distance (OW to IW)	_____	_____	_____	_____
Total Well Depth	_____	_____	_____	_____
Casing/Screen Size & Material	_____	_____	_____	_____
Screen Slot Size	_____	_____	_____	_____
Screened Interval (depths)	_____	_____	_____	_____
Grout Material	_____	_____	_____	_____
Filter Pack Material and Size	_____	_____	_____	_____
Drilling Scenario (A or B)	_____	_____	_____	_____

**B) Testing Equipment:**

Injection (e.g., blower);  
 Brand/Model \_\_\_\_\_  
 Specifications \_\_\_\_\_

**C) Test Parameters:**

Duration of Test \_\_\_\_\_  
 Proposed Air Injection Rate (cfm) \_\_\_\_\_

**D) Test Analytical:**

Field Analysis:

Sampling Frequency \_\_\_\_\_  
 Sampling Method \_\_\_\_\_  
 Device (Brand/Type/Specifications) \_\_\_\_\_  
 Calibration Standard & Frequency \_\_\_\_\_

Laboratory Analysis:

Number of Samples \_\_\_\_\_  
 Collection Frequency \_\_\_\_\_  
 Collection Location \_\_\_\_\_  
 Analytical Methods \_\_\_\_\_  
 Laboratory to Conduct analysis \_\_\_\_\_  
 Collection Methods \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**5. Other Testing Required for RDP.** If technological specific testing, other than listed in this worksheet, will be required to develop a remedial design plan for the specified site, provide an attachment with this worksheet that describes in detail the testing proposed, field or laboratory work associated with the testing, and how the testing will be utilized for the remedial technology proposed.

**IV. Site Map**

**Note:** All maps include a scale, north arrow, and legend.

Prepare and submit with this worksheet a site map in accordance with and containing the following information:

- A. Scale of not more than 1 inch = 50 feet for smaller site and not more than 1 inch = 100 feet for larger sites.
- B. Site property boundaries, buildings, and other fixed objects.
- C. Site map must depict the site including a minimum of a one block radius around the site with the general use of surrounding properties identified; i.e. residential, industrial, business (indicate what type-fast food, service stations, etc.). List owners names relative to off-site properties.
- D. Tanks, lines, ad pump island, currently or formerly located at site.
- E. Proposed boring and monitoring well locations. Include any existing wells within the specified area.
- F. Proposed vapor extraction and observation well locations for the SVE test, BVS test, and the pumping well with associated observation well locations for the pump test.
- G. Pump test discharge route and point of disposal
- H. Accessible easements within the specified area.

**V. Field Personnel**

List below the consultant's personnel and any subcontracting firms that will be involved in the field work. Indicate each individual's name, company, position title, and general duties. If resume documenting education, experience, and safety training certification have not been provided with the original bid package for all those listed, submit the information with this worksheet. Attach additional sheets if necessary.

Name	Company	Position Title	Duties
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**ATTACHMENT F**  
**TIME SHEETS**

**KDHE TRUST FUND TIME SHEET LOG  
FOR FIELD ACTIVITIES**

**SITE NAME:** \_\_\_\_\_  
**SITE ADDRESS:** \_\_\_\_\_  
**KDHE SITE CODE:** \_\_\_\_\_  
**CONSULTANT:** \_\_\_\_\_  
**PROJECT MANAGER:** \_\_\_\_\_

NOTE: This form is to be maintained during all field activities. All Workers must sign, date and list the time they arrive and depart from the site. This must be done each time a worker arrives or departs the site. A COPY OF THIS FORM MUST ACCOMPANY ALL REQUESTS FOR REIMBURSEMENT.

DATE	PRINT WORKERS NAME	WORKER'S SIGNATURE	JOB TITLE	TIME STARTED	TIME FINISHED	TOTAL TIME FOR DAY

I certify that the names and signatures above are those of the actual people who worked on the referenced site during the dates and times stated.

Signed: \_\_\_\_\_  
 Consultant Project Manager

Date: \_\_\_\_\_

I certify that the information on this sheet is true and accurate to the best of my knowledge.

Signed: \_\_\_\_\_  
 Owner/Operator or Authorized Representative

Date: \_\_\_\_\_

**KDHE TRUST FUND TIME SHEET LOG  
FOR OFFICE ACTIVITIES**

**SITE NAME:** \_\_\_\_\_  
**SITE ADDRESS:** \_\_\_\_\_  
**KDHE SITE CODE:** \_\_\_\_\_  
**CONSULTANT:** \_\_\_\_\_  
**PROJECT MANAGER:** \_\_\_\_\_

NOTE: This form is to be maintained during all office activities. All Workers must sign, date and list the time they work on the site project. A separate form must be maintained for each site project. A COPY OF THIS FORM MUST ACCOMPANY ALL REQUESTS FOR REIMBURSEMENT.

DATE	PRINT WORKERS NAME	WORKER'S SIGNATURE	JOB TITLE	TIME STARTED	TIME FINISHED	TOTAL TIME FOR DAY

I certify that the names and signatures above are those of the actual people who worked on the referenced site during the dates and times stated.

Signed: \_\_\_\_\_  
                     Consultant Project Manager

Date: \_\_\_\_\_

**ATTACHMENT G**  
**OWNER/OPERATOR STANDARD CONTRACT**

AGREEMENT

This **AGREEMENT** entered into between \_\_\_\_\_  
\_\_\_\_\_(OWNER/OPERATOR) hereinafter referred to as the O/O;  
and \_\_\_\_\_ (VENDOR),  
hereinafter referred to as the Vendor.

**WHEREAS**, the \_\_\_\_\_ (O/O) is in need of  
Underground Storage Tank consulting and testing services at  
\_\_\_\_\_ and

**WHEREAS**, the O/O has requested bids from qualified firms to provide  
said services, and

**WHEREAS**, the Vendor is qualified to provide the required services.

1. The Vendor shall perform all services called for under Request for Proposal in accordance with the specifications called for in said RFP. A copy of said RFP is attached hereto and incorporated herein.
2. The O/O shall compensate the Vendor for its services under the terms and conditions of said RFP in the amount of \$\_\_\_\_\_, with payment to be made upon successful completion of the Project.
3. The provisions found in the contractual Provisions attached hereto and executed by the parties to the AGREEMENT, are hereby incorporated in this AGREEMENT and made a part hereof.

**IN WITNESS WHEREOF**, we have hereunto set our hands below on the date specified.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Owner/Operator

\_\_\_\_\_  
Date

\_\_\_\_\_  
Vendor

**CONTRACTUAL PROVISIONS**

Important: This form contain mandatory contract provisions and must be attached to or incorporated in all copies of any contractual agreement. If it is attached to the Vendors standard contract form, then that form must be altered to contain the following:

**“The provisions found in the Contractual Provisions, form # O/O 101, 7/92, which is attached hereto and executed by the parties to this agreement, are hereby incorporated in this contract and made a part hereof.”**

The parties agree that the following provisions are hereby incorporated into the contract to which it is attached and made a part thereof.

**4. TERMS HEREIN CONTROLLING PROVISIONS**

It is expressly agreed that the terms of each and every provision in this attachment shall prevail and control over the terms of any other conflicting provision in any other document relating to and a part of the contract in which this attachment is incorporated.

**5. AGREEMENT WITH KANSAS LAW**

All contractual agreements shall be subject to, governed by, and construed to according to the laws of the State of Kansas.

**6. ANTI-DISCRIMINATION CLAUSE**

The Vendor should comply with the Kansas Act Against Discrimination (K.S.A. 44-1001 et seq.) and the Kansas Age Discrimination in Employment Act (K.S.A. 44-1111 et seq.) and to not discriminate against any person who performs work hereunder, because of race, religion, color, sex, physical handicap unrelated to such person's ability to engage in this work, national origin or ancestry, or age.

**7. ACCEPTANCE OF CONTRACT**

This contract shall not be considered accepted, approved or otherwise effective until the required bonds and insurance certificates are received by the O/O.

**8. REPRESENTATIVE'S AUTHORITY TO CONTRACT**

By signing this document, the representative of the Vendor hereby represents that he/she is duly authorized by the Vendor to execute this document on behalf of the Vendor and that the Vendor agrees to be bound by the provisions thereof.

**9. RESPONSIBILITY FOR TAXES**

The Owner/Operator will not be responsible for, nor indemnify a Vendor for, any federal, state or local taxes which may be imposed or levied upon the subject matter of this contract.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Owner/Operator

\_\_\_\_\_  
Date

\_\_\_\_\_  
Vendor

**ATTACHMENT H**  
**EQUIPMENT STANDARDS**

## Equipment Substitutions

Equipment substitutions will not be allowed during the bidding phase of the project and all bids will be based on the equipment specified in the approved RDP. All equipment substitution requests will be considered after the bid has been awarded and will be included with the Engineering Review. Substitute equipment must be approved in advance by the KDHE project manager in consultation with the design engineer and KDHE Technical Services Staff. KDHE intends that equipment substitutions under the definition of “same or equal” will be approved liberally in order that the implementation contractors may select and install equipment to meet their own convenience and preferences whenever possible. KDHE reserves the right to require installation of the equipment approved in the RDP design plan if an agreement cannot be reached with the KDHE review staff. It is the responsibility of the contractor to provide adequate documentation to confirm that the proposed equipment meets the following criteria.

1. Performance standards—The proposed equipment must meet or exceed the performance requirements as set forth by the approved design plans and specifications. For example, a substitute pump must be able to provide the minimum flow rate and pressure that is specified, and must be able to operate across the general range of flow rates and pressures that are required by the system. When other factors are important to the successful operation of the system (e.g temperature limitations, power supply requirements, duty cycle, or explosion proof design) the proposed equipment must also meet those operational requirements in order to be approved by the KDHE staff. KDHE reviewers generally will not refuse to approve equipment substitutions solely because of minor differences such as marginal efficiency variations or different materials of construction. All Explosion Proof (XP) equipment proposed in the approved RDP specifications will remain XP equipment. TEFC will not be an allowable substitution.
2. Operating principles—Substitutions will generally be approved for equipment which meets performance standards as described above even if the operating principle is different than the equipment specified in the approved RDP design plan. For example, positive displacement blowers may be approved in lieu of regenerative blowers. When the operating principals of the proposed substitution differs substantially from the design, to the extent that the operation and maintenance costs will be substantially affected (e.g. carbon treatment instead of air stripping), the KDHE Technical Services staff and the project manager will determine the effectiveness of the proposed equipment and the cost benefit to the project. It is the responsibility of the project engineer to provide adequate information as to the cost of equipment and cost of operation of the proposed technology so an informed decision can be made by KDHE review staff. Failure to provide adequate information on the proposed technology will result in denial of the proposed equipment.
3. As-built drawings and reports—Completed installations must be documented by as-built drawings and reports. All as-built reports will be stamped and signed by the Project Engineer.
4. Bidders who propose the use of alternate technology should detail all additional operational or maintenance costs for the equipment during a two year period of operation.

## **Remote Telemetry**

The minimum equipment design/specifications should be capable of allowing KDHE and/or SRP contractor personnel to:

1. Verify the equipment is operating properly by remote monitoring methods such as automatically contacting designated people, as specified by the project manager, in the event of an alarm status.
2. Use telemetry system generated reports as back-up data to support or verify the hour meter readings .

In order to meet these criteria, all electrically operated treatment systems should be provided with an integrated remote telemetry system which is appropriate to the complexity of the treatment system. The equipment must include at least one input channel for each item of equipment included in the interlock system, remote communication capability (minimum fax or e-mail), a programmable emergency contact list for alarm conditions, a battery backup, surge suppressor, and appropriate sensors or connections for the equipment and alarm conditions. The contractor will supply the KDHE staff with any necessary software or contact information to obtain access to the systems. The use of each input shall be clearly described in the Final Remedial Report. The project manager may also specify the telemetry equipment include additional input channels and sensors, additional capabilities such as data logging, remote access to current system status reports, etc.

**ATTACHMENT I**  
**LANDFARM APPLICATION INFORMATION**

## **Remedial Design Plan RFP Landfarm Application Information**

Prior to submitting the landfarm application to KDHE Bureau of Waste Management (BWM), a District Office or KDHE representative *must* visit and evaluate the proposed landfarm area to insure human health & environment will not be threatened. Evaluation criteria include:

- 1) Groundwater depth must be greater than 10 feet.
- 2) Sufficient native soils (not sand) must be available to create 24 inch high berms to surround the landfarmed soils and prevent run-on and run-off.
- 3) A distance of at least 500 feet from homes, schools, public water supplies, domestic wells, surface waters and other sensitive environments must be observed.
- 4) Fencing will be required at any landfarm within ½ mile of homes, parks, schools and other places where children typically play.

For a more detailed list of requirements, see the Application to Landfarm Petroleum Contaminated Soils and the KDHE Project Operating Plan and Site Closure Plan in Attachment I.

The following information must be included with the landfarm application:

For the proposed landfarm area:

- 1) An area map clearly showing the proposed landfarm area on a portion of the relevant USGS 7 ½ minute topographic map.
- 2) A landfarm site map.

From the Trust Fund site:

- 3) Soil contamination information detailing the source, type: gasoline - leaded or unleaded, gasohol, diesel, waste oil, etc., and degree of contamination, as determined through field readings and observations and
- 4) Lead in soil information. readings are to be obtained from at least one well in the source area or other area where excavation is planned. Up to four samples can be sent for analysis. Samples to be sent should be from zones of greatest contamination as determined by field readings (gasoline range) and/or sight and odor for heavier range hydrocarbons. A background lead sample should also be taken from a well that is anticipated to be non detect, such as an upgradient well.

All landfarm leases must be for a period of one year, with an option for a second year. Diesel and any heavier range hydrocarbon contaminated soils are to be turned NO MORE THAN once a month. Nutrients **must** be added to diesel range and any heavier range hydrocarbon contaminated soils. At all landfarms, moisture must be preserved to adequately support microbial growth. During dry periods, gasoline range soils are to be turned no more than once a month.

### **Information to be included in the Project Operating Plan and Site Closure Plan**

Upon delivery and off-loading of contaminated soils at the approved landfarm site, the Vendor or his subcontractor will spread the soils no greater than 6 - 8 inches in height within the bermed area. The Vendor will conduct or oversee three tilling events, no more than once a month for diesel, waste oil and other heavier range hydrocarbon contaminated soils.

*Notification by the Vendor to KDHE is required two days prior to soil turning events.* Thirty days after the last tilling event, the Vendor will conduct field screenings of the landfarmed soils. The KDHE representative or District Office will be notified of the field readings promptly. If field readings and observations indicate the soil is non detect, grab samples will be taken from each 100' by 100' area and submitted for laboratory analysis. Samples will be taken from areas that have, throughout the landfarming process, shown the most contamination. Prior to obtaining samples for laboratory analysis, KDHE must be notified. KDHE reserves the right to oversee sample collection and collect split samples. Samples must be analyzed for TPH-OA1, TPH-OA2, BTEX, 1,2 DCA and Total Lead. The landfarm can be closed, with written approval from KDHE, only after all samples come back non detect for all hydrocarbon components. At closure, the landfarmed soils become the property of the landfarm property owner.

A copy of the approved section of the RDP, which includes the Project Operating Plan and Site Closure Plan, must be given to the proposed landfarm property owner.

**Landfarm Property Owner Consent Form**

The owner and proposed operator of the proposed landfarm area must be given a copy of the Project Operating Plan and Site Closure Plan. The landfarm property owner must sign that they have read the Project Operating Plan and Site Closure Plan, and that these plans will be followed.

**EXHIBIT 1**  
**SITE SPECIFIC INFORMATION**

**EXHIBIT 2**  
**PROJECT BID PROPOSAL SHEETS**